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## DISEASES CAUSED BY BACTERIA AND FUNGI

Mondini, S. & Gasparini, U. (1960). Studio di stafilococchi isolati da mammelle bovine sane. [Staphylococci isolated from healthy cows' udders.]—Nuova Vet. 36, 88-94. [Summaries in English and French.] 300

Of 586 strains of staphylococci isolated from milk samples from clinically healthy cows 51 were pathogenic (31 were lysed by phage 47C) and were similar to the organisms isolated from granulomatous staphylococcal mastitis clinically resembling actinomycosis.

—T.E.G.R.

Plommet, M. (1960). Essais de traitement de la mammite staphylococcique de la vache par vaccination locale. [Treatment of staphylococcal mastitis in cows by injection of vaccine into the udder.]—Ann. Inst. Pasteur 99, 618-623. [Summary in English.] 301

The vaccine was made up from 10 units per ml. of staphylococcal alpha toxoid, 5 units/ml. of beta toxoid and killed staphylococci of various animal strains at a concentration of 6,000 million organisms per ml. Doses of 2.5 ml. were introduced into the teat of each affected quarter and treatment was repeated three or four times at an interval of 5-8 days. Nineteen quarters in fifteen cows were treated: 7 quarters (all infected with alpha-haemolytic strains) recovered after the first treatment, 2 after the second and one after the third. Only three of 10 quarters infected with alpha and beta haemolytic strains were cured.—R.M.

Plommet, M. (1960). Mammite staphylococcique de la brebis. Infection expérimentale. [Experimental staphylococcal mastitis in sheep.]—Ann. Inst. Pasteur 98, 439-455. [Summary in English.] 302

When pathogenic staphylococci from a ewe with mastitis were inoculated into the teat in a single dose of between 4 and 33 organisms, 20 of 24 lactating ewes with

apparently healthy udders developed mastitis. It tended to become gangrenous in ewes with low antitoxin content of the blood and those that yielded more than 200 ml. of milk daily. During the first 12 hours the number of staphylococci in the udder multiplied by between 1,000 and 10,000 times without apparent reaction in the animal. Severe incurable lesions and a leucocytic reaction became established 24 hours after inoculation. Staphylococci did not multiply in the udder of sheep rendered resistant by prior unsuccessful infection.—R.M.

Ovejero, S., Rejas, F. & Villalon, F. (1960). Antibiogramma di alcuni stafilococchi di origine umana ed animale. [Antibiotic sensitivity of staphylococci isolated from man and animals.]—Zooprofilassi 15, 403-412. 303

Tetracycline, erythromycin and chloramphenicol were highly active against strains of staphylococci isolated from gangrenous mastitis in sheep and goats and strains of *Staph. pyogenes* isolated from man and animals. Penicillin, framycetin and kanamycin showed very little activity. On the whole the strains from ovine and caprine mastitis were more resistant than *Staph. pyogenes*. The strains isolated from man were more resistant to penicillin than those of animal origin, probably on account of the extensive use of the antibiotic in inflammatory and suppurative conditions.—T.E.G.R.

Dineen, P. (1960). Effect of reduction of bowel flora on experimental staphylococcal infection in mice.—Proc. Soc. exp. Biol., N.Y. 104, 760-764. [Authors' summary modified.] 304

Mice in which the intestinal flora had been reduced by neomycin in the diet were much more susceptible to i/v infection with *Staph. aureus* than their litter-mate controls.

Ihlenburg, H. (1960). Experimentelle Prüfung der Streptokokken der serologischen Gruppe D als Endocarditis-Erreger. [Group D streptococci as causative agents of endocarditis.]—Berl. Münch. tierärztl. Wschr. 73, 189-193. [Summary in English.] 305

These organisms were isolated from endocarditis lesions in a stallion. Endocarditis was produced in one of three g.pigs and in one of three rabbits inoculated with cultures of the organisms.—R.M.

Burdon, K. L. & Wende, R. D. (1960). On the differentiation of anthrax bacilli from *Bacillus cereus*.—J. infect. Dis. 107, 224-234. [Authors' summary modified.] 306

Attenuated and non-virulent variants of anthrax bacilli retain the salient characteristics of the typical virulent strains from which they were derived, and remain definitely separable from *B. cereus*. The lethal illness and local ulcerative skin lesions produced by s/c inj. of pure actively-multiplying strains of *B. cereus* into mice, g.pigs or rabbits is not anthrax, but a disease due to the independent pathogenicity of these cultures. Animals immune to anthrax are as susceptible as normal rabbits to this infection with active, young *B. cereus*. Confusion of this experimental disease with anthrax may arise through the inadvertent use of mixed cultures containing both *B. cereus* and *B. anthracis*. Such mixed cultures generally have the outward appearance and behaviour of pure cultures of *B. cereus*, yet when inoculated into susceptible animals the virulent anthrax organisms, even though present in very small numbers, will kill the animal with the typical signs of anthrax.

Spisni, D. (1959). Ricerche sulle cause della resistenza degli equini all'infezione tubercolare. Rilevante contenuto di acido indol-3-acetico nell'urina degli equini. [Urinary indoleacetic acid and natural resistance to tuberculosis in horses.]—Ann. Fac. Med. vet. Pisa 12, 315-322. [Summaries in English and French.] 307

Urinary concentration of indoleacetic acid was higher in horses and donkeys (3.9 mg.%) than in cattle (0.48), sheep (0.96) or pigs (0.95). In view of its inhibitory action *in vitro* and (apparently) also *in vivo* it is postulated that this acid plays an important role in the natural resistance of horses to TB.

—T.E.G.R.

Heinicke, W. (1960). Die Ermittlung der Genitaltuberkulose bei weiblichen Rindern.

[Genital tuberculosis in cows.]—Zuchthyg. FortpflStörung. u. Besamung 4, 79-83. [Summaries in English and Russian.] 308

During 12 years genital TB. was diagnosed at the Jena veterinary investigation centre in 2,251 cows. H. found that the uterus was involved in 40% of cases, one or both oviducts in 32%, one or both ovaries in 18%, vulva 5%, vagina 1.7% and other organs (peritoneum, lungs, udder) in 3.4%.—R.M.

Hügly, E. (1960). Der Kostenaufwand für die Bekämpfung der Rindertuberkulose in der Schweiz. [The cost of controlling bovine tuberculosis in Switzerland.]—Schweiz. Arch. Tierheilk. 102, 547-551. [Summaries in English, French and Italian.] 309

From 1930 to 1959 compensation was paid for 394,115 tuberculin reactors slaughtered. Up to date the eradication programme has cost 400 million Swiss francs (about £20 million), of which 110 millions were contributed by the federal government, 140 millions by the cantons (counties) and 150 millions by the farmers.—R.M.

Wiśniewski, J. (1959). Przystosowanie modyfikacji odczynu hemolitycznego Middlebrook do masowych badań bydła na gruźlicę. [Adaptation of Middlebrook's test for the mass examination of cattle for tuberculosis.]—Roczn. Nauk rol. 69, 177-207. [In Polish. Summaries in English and Russian.] 310

The haemolytic modification of haemagglutination described by Middlebrook (1950) gave negative results in 164 cows which were free from TB. and positive results in 137 infected cows (85%). The best results were obtained in cows with generalized and pulmonary TB. (96 and 93% respectively). Brucellosis and vaccination with Strain 19 had no effect on the results of the test.

—M. GITTER.

Nabholz, A. & Graf, A. (1960). Magermilch als Ursache einer Tuberkulose-Enzootie bei Rindern und Schweinen. [Skim milk as cause of tuberculosis in cattle and pigs.]—Schweiz. Arch. Tierheilk. 102, 113-119. [Summaries in English, French and Italian.] 311

An outbreak of TB. in which 103 cattle and 112 pigs on 57 farms in an attested district developed tuberculin reactions was due to feeding skim milk from a cow with tuberculous mastitis. In 80% of the cattle the disease was restricted to the primary focus, while most of the pigs showed early generalization.—M.G.G.

Kells, H. R. & Lear, S. A. (1960). **Thermal death time curve of *Mycobacterium tuberculosis* var. *bovis* in artificially infected milk.**—Appl. Microbiol. 8, 234-236. [Part of authors' summary.] 312

The results obtained employing a cell concentration comparable to the maximum probable concentration to be found in naturally infected milk indicate that the present pasteurization standards provide a margin of safety of approximately 28½ min at 143°F, and approximately 14 sec at 161°F.

Nassal, J. (1960). Beitrag zum allergischen Verhalten des aviär infizierten Rindes auf die intrakutane Injektion von albumosefreiem Rinder-Einheitstuberkulin. [Allergic reaction to intracutaneous albumin-free standard tuberculin in cattle infected with avian type bacilli.]—Tierärztl. Umsch. 15, 239-241. 313

Of 352 cattle infected with tubercle bacilli of the avian type, 25% gave a positive and 41% a doubtful reaction to the i/d test injection of bovine tuberculin. The simultaneous test with avian and bovine tuberculins is recommended in attested herds reacting to bovine tuberculin.—M.G.G.

Kirillov, L. V. (1960). [Mixed, purified tuberculin from bovine, human and avian tubercle bacilli and its diagnostic use in animals.]—Veterinariya, Moscow No. 8 pp. 46-48. [In Russian.] 314

Each ml. of the preparation contained 2 mg. of dried purified tuberculin from each of the three types of bacillus. Five times as many fowls reacted to it compared with Old Tuberculin; TB. was found in 37 of 45 reactors. More cattle reacted to it than to bovine tuberculin used alone.—R.M.

Bloch, H. & Nordin, A. A. (1960). **Production of tuberculin sensitivity.**—Nature, Lond. 187, 434-435. 315

Guinea-pigs reacted to tuberculin after injection into the plantar pads of 0.1 mg. PPD tuberculin adsorbed to 100 million monocytes (from peritoneal exudate of g.pigs).—R.M.

Huitema, H. & van Vloten, J. (1960). **Murine tuberculosis in a cat.**—Antonie v. Leeuwenhoek J. Microbiol. 26, 235-240. 316

A cat was submitted to the Rotterdam department of the Netherlands Central Veterinary Institute with TB. lesions in lungs and mesenteric lymph nodes. Attempts to isolate bacteria from the lesions failed, but two g.pigs were injected and cultures obtained

from spleen and lymph nodes of these animals proved to be the murine type of tubercle bacillus. A calf was inj. i/v with a suspension of culture. At 10 to 26 weeks after infection it gave non-specific reactions to the comparative tuberculin test. When slaughtered 7 months after infection no lesions were found, but cultures of murine-type bacilli were obtained from bronchial and mediastinal lymph nodes. Growth of the organism on Löwenstein's medium without glycerol did not commence until 4½ months after inoculation. Cultural properties of the organism and infection in g.pigs are also described. A similar case has been reported by C. A. van Dorssen. [In our abstract of van Dorssen's case (V.B. 30, 3471) it was wrongly stated that the report by Huitema & van Vloten concerned the same cat. The two cases were discovered quite independently.]—R.M.

Varyushin, V. Y. (1960). [Extent of infection of buildings and runs on poultry farms infected with tuberculosis.]—Veterinariya, Moscow No. 6 pp. 44-46. [In Russian.] 317

Infectivity was tested by placing young fowls in houses and runs on three infected farms and by examining soil samples from runs. It was concluded that infected birds disseminated tubercle bacilli throughout the houses and runs. Infected runs were probably safe after three years had elapsed. Disinfection was discussed.—R.M.

Kertay, N. & Fodor, T. (1960). Untersuchungen mit der intracutanen Impfmethode am Kaninchen zur Typenbestimmung des *Mycobacterium tuberculosis*. [Intracutaneous inoculation of rabbits for typing strains of tubercle bacilli.]—Zbl. Bakt. I. (Orig.) 180, 80-83. [Summaries in English, French, Spanish and Russian.] 318

Hair was removed from an area of skin on the back of a rabbit and the area was divided into squares by painting lines on the skin. The reaction to intradermal inoculation of 0.2 ml. of a saline suspension of the strain under test was compared with the reaction to standard strains. Between 25 and 30 strains could be typed on one animal.—R.M.

Toda, T., Takeya, K., Matsumura, K., Hisatsune, K. & Takehara, Y. (1960). **Biologic properties of mycobacteria isolated from dogs.**—Amer. Rev. resp. Dis. 82, 414-415. 319

Seven strains isolated from lymph nodes of stray dogs in Japan were human type

tubercle bacilli, while six others apparently belonged to the unclassified mycobacteria.

—R.M.

Juhlin, I. (1960). **Methods for the grouping and typing of mycobacteria. 1. Differentiation of mycobacteria into *M. tuberculosis* and anonymous mycobacteria. 2. Differentiation of *Mycobacterium tuberculosis* into *typus humanus* and *typus bovinus*. 3. Differentiation of anonymous mycobacteria into groups, sub-groups or types.**—Acta path. microbiol. scand. 50, 177-187; 188-194 & 195-207. [In English. Author's conclusion modified.] 320

A selection of new methods for grouping and typing mycobacteria were tried out: many were modified either to diminish the danger of laboratory infection or to adapt them to routine laboratory work. Special attention was devoted to the nicotinamidase test which may be used in special complicated cases for differentiation between human type and bovine type tubercle bacilli. Mycobacteria were divided into *M. tuberculosis* and anonymous mycobacteria by means of salicylate test, catalase activity test and resistance to isoniazid. *M. tuberculosis* of human type and bovine type, and also BCG-strains, were distinguished by means of niacin test, resistance to thenoyl-2-hydrazine and furfuroyl-2-hydrazine and by transhydrogenase activity. Differentiation of anonymous mycobacteria into groups and sub-groups or types was done by means of ability to form pigment, rapidity of growth and amidase activity test.

Ringdal, G. (1960). **Diagnosis of Johne's disease in cattle.**—Nord. VetMed. 12, 513-531. [In English. Summaries in German and Danish.] 321

The results of the c.f. test, microscopic examination and culture of the faeces and scrapings of rectal mucosa, and P.M. examination, were compared in about 700 cattle. The c.f. test revealed about 60% more infected cattle than microscopic examination of rectal scrapings, more than twice as many as microscopic examination of the faeces, and about 40% more than microscopic examination of both rectal scrapings and faeces. Culture of the faeces was positive in 26% of cattle reacting to the c.f. test, and culture of rectal mucosa was positive in 57% (16 out of 28) of reactors to the c.f. test. The c.f. test is considered to be the only suitable test for the early diagnosis of Johne's disease.—M.G.G.

Schaaf, J. & Beerwerth, W. (1960). **Die allergische und serologische Diagnose der Paratuberkulose. [Allergic and serological diagnosis of Johne's disease.]**—Rindertuberk. u. Brucellosis 9, 103-114. 322

The c.f. reaction was positive in 184 (93%) of 198 cattle with clinical Johne's disease and the allergic reaction was positive in 30 (71%) of 42 such cattle. Two of these 42 were positive to the allergic and not to the c.f. test and 11 to the c.f. and not to the allergic test. Tests in 20 infected herds containing 1,100 cattle showed that latently infected animals could be detected only by submitting to allergic and c.f. tests simultaneously every 4 months. Of 389 cattle with Johne's disease 144 (37%) gave positive or doubtful reactions to bovine tuberculin, but 51 (72%) of 71 were negative in a second test 4 months later. In tuberculin tests Johne's disease was in most cases distinguishable from infection with bovine or human type bacilli, less easily so from "skin tuberculosis", and not at all from infection with avian type bacilli.—M.G.G.

Mukerji, A. & Lahiri, A. (1960). **Investigation of Johne's disease in buffaloes.**—Indian vet. J. 37, 349-353. 323

On microscopic examination of material, collected during life and/or after death, from 205 buffaloes, including 175 in the slaughterhouse and 30 in the hospital, *Mycobacterium johnei* was detected in 8.—R. N. MOHAN.

Ressang, A. A. & Titus, I. (1960). **A case report of lepra bovina in a Holstein-Friesian cow.**—Commun. vet., Bogor 4, 47-50. [In English. Summary in Indonesian.] 324

There have been previous reports of bovine leprosy in the indigenous cattle of Indonesia, but this is the first case in an imported breed.—R.M.

Stoll, L. (1960). **Atypische Corynebakterien in der Milch. [Atypical corynebacteria in milk from cows with mastitis.]**—Berl. Münch. tierärztl. Wschr. 73, 270-272. [Summary in English.] 325

Corynebacteria were isolated from the milk of 6 out of 100 cows with mastitis, in medium containing nitrofurazone. Although biochemically close to *Erysipelothrix (Listeria) monocytogenes*, one strain being identical, and reacting with polyvalent immune serum against *Erysipelothrix*, they were immotile and were not  $\beta$ -haemolytic.—M.G.G.

Aktan, M. & Aktan, F. (1960). Die Entstehung der L-Phase von *Corynebacterium pyogenes* nach der Antibiotikabehandlung einer an Pyogenes-mastitis erkrankten Kuh. [L forms of *C. pyogenes* in udder secretion from mastitis treated with antibiotics.] — Dtsch. tierärztl. Wschr. 67, 405-408. [Summary in English.] 326

After a cow with *C. pyogenes* mastitis had been treated with antibiotics, the udder secretion contained L forms of the organism, which reverted to the normal form 10 days later. The phenomenon was demonstrated repeatedly in this cow. *C. pyogenes* also assumed the L form *in vitro* under the influence of penicillin and became normal again when grown in medium free from antibiotic.—M.G.G.

Wellmann, G. & Liebke, H. (1960). Nachweis von Rotlaufbakterien (*Erysipelothrix rhusiopathiae*) und deren Antikörper bei Wildschweinen (*Sus scrofa L.*) [Demonstration of swine erysipelas bacilli and specific antibodies in wild pigs.] — Berl. Münch. tierärztl. Wschr. 73, 329-332. [Summary in English.] 327

Of 8 wild pigs infected cutaneously with *Erysipelothrix rhusiopathiae*, 4 developed local skin reactions, and one of these died from septicaemia. Specific antibodies were demonstrated in all of 17 wild pigs, and 12 strains of the organism were isolated from the tonsils. One belonged to Group A, the remainder to Groups B or N. Their pathogenicity for domestic pigs was usually weak, but a few animals developed generalized infection, with one case of endocarditis and one of polyarthritis.—M.G.G.

Müller, H.-D. & Uhlig, H. (1960). Zur Chemie und Immunchemie von Bakterieninhaltsstoffen und Technologie der Impfstoffe. IV. Mitteilung: Spezielle Untersuchungen am Hapten der Rotlaufbakterien (*Erysipelothrix rhusiopathiae*) und ihren Extraktionsrückständen. [Haptens of swine erysipelas bacilli and their extraction residues.] — Arch. exp. VetMed. 14, 198-203. 328

The hapten fractions obtained from erysipelas bacilli by tenfold extraction with hydrochloric acid were examined by chemical and immunological methods. It was concluded that hapten was not distributed over all the surface of the bacillus. When hapten is separated from bacillus new amino groups are found both in the hapten and in the bacterial residue.—R.M.

Andrews, M. F., Eveleth, D. F. & McIlwain, P. K. (1960). Preliminary report on the effect of hypoglycemia on listeriosis. — Vet. Med. 55, No. 12 pp. 71-73. [Authors' summary.] 329

Twenty clinically healthy lambs were given *L. monocytogenes* by intravenous injection. Ten of these lambs were given insulin to lower the blood glucose. The lambs receiving the insulin seemed to receive some protection against the infection, as indicated by clinical symptoms and temperature rise.

Potel, J. & Degen, L. (1960). Zur Serologie und Immunbiologie der Listeriose. I. Mitteilung: Die Wachstumsprobe. [Serology and immunology of listeria infection. I. The growth test.] — Zbl. Bakt. I. (Orig.) 180, 61-67. [Summaries in English, French, Spanish and Russian. English summary modified.] 330

The test as developed for swine erysipelas diagnosis by Wellmann [V.B. 26, 2501] is also useful for serological examinations in listeriosis and may be helpful for type diagnosis. It is to be regarded as specific at serum titres greater than 1: 50. It is based on inhibition by antibodies of the growth of cultures.

Riddell, J., Norval, J. & Anderson, G. K. (1959). An outbreak of salmonellosis in a cattle court dairy farm. — Health Bull. Dept. Hlth Scotland 17, No. 4 pp. 67-71. 331

*S. typhi-murium* was isolated from the faeces of four human beings in Midlothian. They all drank milk from one farm. One cow had died from diarrhoea but no bacteriological examination was made: another similar case occurred and *S. typhi-murium* was isolated from bile, intestines and muscle. Diarrhoea had also occurred among the farm workers and several had the salmonella in their faeces. Examination of faeces from the whole herd (100 milch cows and 300 dry cows and heifers) revealed that 15 cows were excreting salmonella. Four subsequent examinations revealed fresh infection in a further 52 animals. The whole herd was treated with a nitrofuran drug (unspecified) for five days, and faeces samples were negative after this. Milk from infected cows was destroyed during the outbreak. Epidemiological aspects were discussed.—R.M.

Arroyo, G. & Bolaños, R. (1960). Salmonella en bovinos adultos, aparentemente sanos, destinados al consumo. [Salmonella in organs and tissues of apparently healthy cattle

slaughtered in Costa Rica.]—Rev. Biol. trop., Costa Rica 8, 49-52. [English summary modified.] 332

Material examined from 195 adult cattle included faeces, intestinal mucosa, lymph nodes, spleen, and liver or bile. *Salmonella* was isolated from 26 cattle. The serotypes found were, in order of frequency: *S. panama*, *newport*, *give*, *abortus-bovis*, *london*, *typhi-murium*, *muenchen* and *edinburg*.

Singer, S. & Brandy, P. J. (1960). *Salmonella in horse meat*.—Appl. Microbiol. 8, 190-192. [Authors' summary modified.] 333

Horse meat produced in the same establishment as that suspected of causing clinical salmonellosis in dogs was examined for *salmonella*. Eleven serotypes were isolated. *Salmonella derby* and *S. anatum* were isolated most often.

Carteri, L. (1960). Ricerca delle salmonelle nei suini e bovini macellati per il consumo. [Salmonella in slaughter pigs and cattle.]—Vet. ital. 11, 473-481. [Summaries in English, French and German.] 334

*Salmonella senftenberg* was isolated from mesenteric lymph nodes (but not from bile or faeces) of 5 out of 1,020 slaughter pigs; it was not demonstrable in mesenteric lymph nodes, bile or faeces of 417 slaughter cattle.

—T.E.G.R.

Kučera, P. (1960). Výskyt salmonel ve tkání jater a sleziny vepřů nepodezřelých z nakažení salmonelami. [Incidence of salmonella in liver and spleen of apparently healthy pigs.]—Veterinářství 10, 190-192. [In Czech.] 335

*Salmonella muenchen* was isolated from one, *S. anatum* from four, and *S. derby* from six samples of spleen and liver of 1,610 apparently healthy pigs slaughtered at the Prague abattoir.—E.G.

Zaharija, I. (1960). *S. choleraesuis* var. *Kunzendorf* i *S. enteritidis* u štakora *Epimys norvegicus*. [*S. cholerae-suis* var. *kunzendorf* and *S. enteritidis* in rats.]—Vet. Arhiv 30, 124-127. [In Croat. Summaries in English and French.] 336

*Salmonella enteritidis* was isolated from a rat in 1936, and *S. cholerae-suis* var. *kunzendorf* from three of 276 rats poisoned in Zagreb during 1951-53. The role of rats in the epidemiology of salmonellosis in man and animals was discussed.—E.G.

Schwerin, K.-O. (1960). Möwen als Salmonella-enausscheider und ihre Bedeutung für die Verseuchung von inländischem Fischmehl. [Gulls as excretors of salmonella and their role in the pollution of fish meal.]—Mh. VetMed. 15, 377-379. 337

*S. newington* was isolated from gulls' droppings near a fish-meal factory, in which samples of fish meal occasionally yielded *S. newington* in spite of strict hygienic precautions.—M.G.G.

Lucas, A., Laroche, M., Durand, J. & Chauvrat, J. (1960). *Salmonella pullorum* dans quelques espèces animales rarement infectées. [Isolation of *Salmonella pullorum* from animals rarely infected with this type.]—Rec. Méd. vét. 136, 731-734. [Summaries in English and Spanish.] 338

*S. pullorum* was isolated from a lark, a young mink that had been fed on raw egg, a nutria, 4 hares, and a g.pig. Obvious pathogenic effects of the organism were seen only in the lark.—M.G.G.

Spink, M. S. (1960). *Broilers*.—Lancet, September 24th 707-708. 339

The origin of an outbreak of *Salmonella thompson* infection in 35 people was traced to a broiler shop. The organism was isolated from cooked chicken and from the faeces of the manager and his assistant, and was reported to have been isolated from living broilers at a packing station supplying the shop.—M.G.G.

Entel, H. J. (1960). Über die Verwendung des Kation-Austauschers "Duolite" zur Anreicherung von Brucella-Bakterien im Blut von Rindern und Schafen. [Use of the cation-exchange resin "Duolite" for enhancing growth of brucella in cultures of blood from cattle and sheep.]—Berl. Münch. tierärztl. Wschr. 73, 252-254. [Summary in English.] 340

Using the cation-exchange resin described by Huddleson [V.B. 28, 1359], brucella was isolated from the blood of 8 out of 18 cattle and 5 out of 51 sheep positive to serological or allergic tests.—M.G.G.

Anczykowski, F. (1960). Preparation of standardized "Br. abortus" agglutination suspension stained by TTC.—Bull. Off. int. Epiz. 53, 315-326. In English. [In French. pp. 327-338.] 341

The method used to produce a standardized heat-killed suspension of undissociated *Brucella abortus* Strain 19, stained supra-

vitally with triphenyltetrazolium chloride for use in agglutination tests and milk ring tests is described in detail.—A. ACKROYD.

Gargani, G. & Aleandri, M. (1960). La reazione di fissazione del complemento nella diagnosi di brucellosi: indagini su animali da esperimento e su sieri umani, bovini ed ovini. [The complement-fixation test in brucellosis in laboratory animals, man, cattle and sheep.] —Zooprofilassi 15, 177-180. 342

Antigens were prepared (by alternate freezing and thawing) from *Brucella abortus* and from *Br. melitensis* and titrated against the serum of rabbits infected with the corresponding organisms. By means of the c.f. test it was possible to distinguish between *Br. abortus* and *Br. melitensis* infection in experimental animals. In human brucellosis there were no differences in titre against either antigen while the reaction was on the whole predominantly positive to *abortus* antigen in cattle and to *melitensis* in sheep.—T.E.G.R.

Parnas, J., Zwolski, W., Burdzy, K. & Koslak, A. (1960). Zoological, entomological and microbiological studies in natural foci of anthroponozoonoses. *Brucella brucei* into *Hoplopleura acanthopus* Burm.—Arch. Inst. Pasteur Tunis 37, 195-213. [In English.] 343

*Brucella brucei* was isolated on several occasions from lice, *H. acanthopus*, that had fed on experimentally infected voles, *Microtus arvalis*, but not from ticks, *Ixodes ricinus*, that had fed on these voles. *Brucella* and leptospira were not recovered from the ectoparasites of wild voles in Poland nor from those of voles and lab. mice infected experimentally with *L. grippo-typhosa*.—M.G.G.

Korolev, P. A. & Konstant, E. G. (1960). [Oral immunization with live brucella vaccine.] —J. Microbiol., Moscow No. 10 p. 103. [In Russian.] 344

Twenty mice and 36 guinea-pigs were given brucella vaccine (presumably Strain 19-BA) in milk: 1,000 million organisms in 0.5 ml. milk. Antibody response was studied. Nine g.pigs were challenged three months later with *Br. melitensis*, also given in milk in a dose of 5,000 million organisms. The results were scarcely conclusive, but they were regarded as worth following up with more extensive experiments.—R.M.

Seelemann, M., Czernicki, B., Meyer, A. & Klepp, J.-L. (1960). Antikörper bei Brucellose unter besonderer Berücksichtigung

verschiedener Immunisierungsverfahren. I. Mitteilung. [Antibodies in brucellosis with special reference to different methods of immunization. I.] —Rindertuber. u. Brucellose 9, 71-90. 345

Opsonin titres between 5·6 and 47·6 were found in 66 cows over 2 years old that had been immunized as calves with Strain 19, and wide fluctuations were observed in individual animals in the course of several months. The high opsonin titres were not associated with high agglutination titres and were not found among 25 similar animals aged one or two years, nor in 93 healthy cattle that had not been immunized. In 48 cows with brucellosis the opsonin titres were between 8·8 and 50. The titres were determined mostly by means of the g.pig leucocyte technique and occasionally with the citrated blood technique.

—M.G.G.

Moldavskaya, A. A., Lifshits-Vasil'chenko, A. A., Yanchenko, M. K., Polyakov, I. I. & Uralkova, V. S. (1960). [Outbreak of brucellosis caused by transfer of *Br. melitensis* to cattle.] —J. Microbiol., Moscow No. 9 pp. 113-116. [In Russian. Summary in English.] 346

*Br. melitensis* infection in 68 persons on a collective farm and a village which obtained its milk from the farm was traced to infected milk. There had been no previous record of human melitensis infection in the locality. There had been an outbreak of brucellosis among sheep on the farm a few months earlier, and over half of them gave positive serological tests. A first examination of the cows for brucellosis was negative, but when it was repeated 8 months later (at about the same time as examination of the sheep) 36 of 205 reacted to the agglutination test. Milk from 30 cows was examined and 9 cultures of brucella isolated were all *melitensis*.—R.M.

Vershilova, P. A. & Ostrovskaya, N. N. (1960). [Classification of species of brucella.] —J. Microbiol., Moscow No. 9 pp. 101-105. [In Russian. Summary in English.] 347

This gives the findings of a meeting held in 1959 of the inter-departmental technical committee on the control of brucellosis of the U.S.S.R. Ministries of Health and Agriculture. By using Huddleson's criteria 97% of Russian strains fell into the three types *melitensis*, *abortus* and *suis* and it was not proposed to alter this classification. Examination of large numbers of wild animals had failed to reveal new hosts of brucella.—R.M.

Rao, S. B. V. & Gupta, B. R. (1960). Studies on the immunization of chickens against spirochaetosis. Part I.—Evolution of a vaccine strain and its maintenance. II. Recent advances in the embryonated tick fever vaccine. III. Immunity studies in tick fever vaccination.—Indian vet. J. 37, 329-331; 332-335 & 335-341. 348

A highly virulent field strain of spirochaetes was adapted to the chick embryo, with apparent decrease in pathogenicity after 37 yolk-sac passages. The initial sensitivity of the spirochaetes to citrate was overcome by gradually increasing its concentration in chicken blood and other material from 0.025% to 0.25%.

The concentration of spirochaetes in the blood was correlated to stunted growth of the chick embryo, irrespective of lesions in the liver, and this was utilized in harvesting material for vaccine production, thereby obviating the microscopic examination of stained blood films from individual embryos. Thiomersal-treated, freeze-dried vaccine conferred better immunity than the formolized vaccine and had no significant effect on growth rate.

There was some evidence that bed bugs were possible mechanical vectors of fowl spirochaetosis.—R. N. MOHAN.

Guida, V. O., Santa Rosa, C. A., D'Apice, M., Corrêa, M. O. & Natale, V. (1959). Pesquisa de aglutininas anti-leptospira no sôro de bovinos do estado de São Paulo. [Survey for leptospira antibodies in serum from cattle in the state of São Paulo.]—Arch. Inst. biol. S. Paulo 26, 109-117. [Summary in English.] 349

Agglutination tests with five serotypes as antigens were done on sera from 763 cattle. Positive results were obtained 30 times with *L. icterohaemorrhagiae* antigen, 14 times with *pomona* antigen, 11 times with *grippo-typhosa* antigen and twice with *canicola* antigen. The titres to *pomona* and *grippo-typhosa* were low. The authors were unable to confirm a previous report by D. C. Freitas and others [Rev. Fac. Med. vet., S. Paulo, 6, 81 (1959)] of the isolation of *L. pomona* from cattle in the State of São Paulo.—R.M.

Zaharija, I. & Romić, Ž. (1960). Eksperimentalna imunizacija kunića i kopitara anavakcinom leptospira. [Experimental vaccination of rabbits and horses with leptospiral vaccines.]—Vet. Arhiv 30, 134-143. [In Croat. Summaries in English and French.] 350

The authors studied the immunizing capacity of formolized and adsorbed vaccines, and of a vaccine prepared by alternate freezing and thawing of culture and subsequent adsorption on aluminium hydroxide, using strains of *Leptospira pomona*, *L. sejroe* and *L. australis*. In rabbits, horses and donkeys, highest titres were obtained with the vaccine prepared by repeated freezing and thawing and lowest with formolized vaccine, but good results were obtained with formolized culture, adsorbed onto 20% aluminium hydroxide.—E.G.

Katić, R., Puhać, I., Vukićević, Z. & Hrgović, N. (1960). Rezultati naših laboratorijskih ispitivanja o značaju spoljašnji faktora za nastajanje infekcije sa klicama *W agni paludis* C i *W agni* var *Wilsdoni* D. [Effect of environmental factors on incidence of infection with *Clostridium welchii* Types C and D.]—Vet. Glasn. 14, 7-11. [In Croat. Summary in French.] 351

*Clostridium welchii* Type C was injected into the jejunum of six g.pigs kept on a diet of hay, oats and beet, at temp. ranging from -3° to 7°C. One died. Of six, kept under similar conditions but infected with Type D, two died. Of two other groups each of six g.pigs on a similar diet, but kept at normal room temp., one group was infected with Type C, resulting in one death, the other with Type D, resulting in two deaths. Following infection with Type C of six g.pigs kept at room temp., but fed fresh clover and grass, three died. Infection with Type D resulted in two deaths in another group of six kept under similar conditions. Twelve controls on a conventional diet at room temp. were infected in groups of six with either Type C or D. Of the former three died, of the latter two.—E.G.

Bryans, J. T. & Smith, A. G. (1960). Physiological properties of pathogenic and nonpathogenic *Vibrio* species isolated from cattle, sheep, and chickens.—Cornell Vet. 50, 331-338. 352

Fifty-five vibrio strains from cattle, sheep and chickens were examined for catalase activity, H<sub>2</sub>S production, reduction of nitrates and tolerance of 4% NaCl, bile salt and sodium selenite. Grouped according to their origin, they were: Group I, 17 strains from aborted bovine foetuses; Group II, 14 strains from aborted ovine foetuses; Group III, 3 strains from hepatitis in chickens; Group IV, 21 strains from semen, preputial and vaginal mucus samples from cattle and sheep. Strains comprising the first 3 groups were considered

to be pathogenic, because of their origin and they all produced catalase, failed to grow in medium containing 4% NaCl and grew on ox bile medium. Only 2 of the group I strains produced H<sub>2</sub>S but half the group II and all the group III strains did.

In group IV, the catalase positive strains from semen and vaginal mucus of cattle behaved exactly like the group I strains. The catalase negative strains from the same group produced H<sub>2</sub>S, grew in media containing 4% NaCl and selenite (0.1%). The catalase negative strains from sheep behaved like the ones from cattle except that the latter did not grow on ox bile whereas the sheep strains did.

There was no correlation between H<sub>2</sub>S production and pathogenicity and the H<sub>2</sub>S production test was the least reliable for differentiation. The ability to produce H<sub>2</sub>S was often correlated with tolerance of sodium selenite.—W. J. BRINLEY MORGAN.

Jakovljevic, D. & Beattie, H. E. R. (1960). Simplified bulk growth of *Vibrio foetus*.—

Nature, Lond. 186, 736-737. 353

The medium consisted of equal parts of meat extract and Martin's peptone (without agar). It was poured into wide glass vessels with flat bottoms to make a layer 1-2 cm. thick. There was no incubation before sowing because this removed water which favoured growth of the organism. The method was suitable for production of antigen for the vaginal mucus agglutination test.—R.M.

Ronéus, O. (1960). Svindysenteri—en för Sverige ny enteritform. [Swine dysentery—a new form of enteritis in Sweden.]—Nord. VetMed. 12, 648-657. [In Swedish. Summaries in English and German.] 354

Vibronic dysentery was diagnosed in southern Sweden in 1959. It affected pigs weighing between 25 and 90 kg. and killed about one in ten.—R.M.

Heinrich, S. & Pulverer, G. (1960). Über den Nachweis des *Bacteroides melaninogenicus* in Krankheitsprozessen bei Mensch und Tier. [*Bacteroides melaninogenicus* in diseases of men and animals.]—Z. Hyg. InfektKr. 146, 331-340. 355

*Bacteroides [Fusiformis] melaninogenicus* was demonstrated in the udder of six of 81 sows with suspected mammary actinomycosis, in two of four cows with mandibular actinomycosis, in the pus of a dental fistula in a horse, in liver material from another horse and an ox and in purulent nasal discharge of

a dog. Details are also given of the isolation of this organism from 621 human beings with various purulent inflammatory processes. [See also V.B. 30, 1357.]—E.G.

Blackburn, P. S. (1960). Reviews of the progress of dairy science. Section E. Diseases of dairy cattle. I. Mastitis. II. Brucellosis.—J. Dairy Res. 27, 435-446 & 446-464. [Author's conclusions modified.] 356

I. Although the elimination of infection with *Str. agalactiae* from herds has been found to be possible, this is probably not so easy to accomplish in areas where the incidence is high, owing to the increased likelihood of re-introduction of infection. Although mastitis caused by this organism has been reduced in British herds by the use of antibiotics the disease is still prevalent. In addition, mastitis caused by staphylococci and by other streptococci has assumed a greater role, and does not respond so well to antibiotic therapy. Much of this mastitis is subclinical and therefore largely ignored. In the present review evidence is given that these other types of mastitis can to some extent be controlled if the repeated mild injury caused by the milking machine is avoided. It has been pointed out that there are 20 or more kinds of infection causing mastitis, and although any of these can be important in individual herds, 99% of all mastitis is accounted for by infection with *Str. agalactiae*, other streptococci, staphylococci and bacilli.

There has been a great increase in the knowledge of the pathology of mastitis, and most authors are now careful to define what they mean by the term mastitis; whether they are referring to severe acute mastitis with systemic symptoms; to heat pain and swelling of a quarter; to the appearance of clots in the fore milk; to mastitis recognizable only by indirect tests or merely to infection of a quarter.

II. It would appear that the term 'Contagious Abortion' in cattle has ceased to have much meaning in countries where there is calfhood vaccination with Strain 19. In such countries the main problem is not so much the aborting animal as the infected animal, particularly the animal giving infected milk, and the consequent risk to the human consumer. Year by year there is an increasing awareness of this problem, and the only sure remedy is the eradication of the disease. The milk ring test has now been generally accepted as a screening test in any scheme for the

eradication of brucellosis. This test done on a sample of bulk milk from a herd will show in most instances whether or not the milking herd contains any reactors and further tests on blood serum or milk from individual animals will reveal these reactors. Provided that there has been no vaccination of adult cattle with live vaccine, reactors can be considered as infected animals.

Pankratov, A. Y., Tret'yakova, A. A. & Smirnov, I. I. (1960). [Tests of immunity in sheep inoculated simultaneously against anthrax, brucellosis and pox.]—Veterinariya, Moscow No. 9 pp. 38-40. [In Russian.] 357

Fifteen sheep aged 8-9 months were given three vaccines, all inoculated at the same time but in different parts of the body: aluminium hydroxide sheep pox vaccine; aluminium hydroxide anthrax vaccine; Strain 19 brucella vaccine. Nine other sheep were inoculated with one of each vaccine. Simultaneous inoculation gave good protection against sheep pox but inadequate protection against *Br. melitensis* and *B. anthracis*.—R.M.

Stoll, L. (1960). Zur Bakteriologie der miliaren Lebernekrose des Kalbes. [Bacteriology of miliary necrosis of the liver in calves.]—Berl. Münch. tierärztl. Wschr. 73, 304-308. [Summary in English.] 358

Bacteria were isolated from 99 of 103 slaughter calves with miliary necrosis: *Salmonella dublin* from 41, corynebacteria from 22, streptococci and staphylococci from 18, *Escherichia coli* from 17, and *Br. abortus* from one.—M.G.G.

Hajsig, M. & Jakovac, M. (1960). Rhodotorula mucilaginosa u patološkom sekretu iz vimena kobile (mastitis mycotica). [Rhodotorula mucilaginosa associated with mastitis in a mare.]—Vet. Arhiv 30, 203-207. [In Croat. Summaries in English and French.] 359

*Rhodotorula mucilaginosa* was isolated in pure culture on malt agar, from the watery secretion of one half of a mare's udder, affected with mastitis. *Streptococcus zoon-epidemicus* was isolated from the other half. *R. mucilaginosa* cultures, which were proved to contain hyaluronidase, appeared to be non-pathogenic for rabbits following i/v injection, and for mice, when given intraperitoneally. Clinical mastitis was, however, produced experimentally in a mare by intramammary infusion into one half of the udder of a three-day-old culture of the yeast, suspended in saline. The condition improved four days

after experimental infection and attempts to isolate the organism eleven days after infection, failed.—E.G.

✓ Gortsevskii, S. A. (1960). [Pathogenesis and pathology of fungal diseases in cows.]—Veterinariya, Moscow No. 9 pp. 71-72. [In Russian.] 360

A sporadic illness in cows was manifested by drop in milk yield followed 5-10 days later by general depression, fever, atony of fore-stomachs, profuse diarrhoea, rapid emaciation. With the onset of circulatory insufficiency, pulmonary oedema and profuse salivation the animals died or were emergency slaughtered. Cows in advanced pregnancy aborted.

The most striking lesions were haemorrhagic infarcts of the mucosa of abomasum, the folds of the omasum, and in the liver (there are illustrations between pages 64 and 65 of the journal). A fungus of the genus *Aspergillus* was isolated and fungal hyphae were seen in histological sections of intestine, omasum and liver. G. suggested that the fungus penetrated the gastro-intestinal mucosa, multiplied in loose connective tissue and affected the nervous system, blood vessels and lymphatics. Generalization with spread to the liver might occur by way of blood vessels.—R.M.

✓ Borisov, A. M. & Mikhailyukova, N. D. (1960). [Pathology of mycotic gastro-enteritis in pigs.]—Veterinariya, Moscow No. 8 p. 66. [In Russian.] 361

Losses among pigs, particularly young-stock, on one farm were attributed to meal infected with fungi of the genera *Aspergillus*, *Penicillium* and *Mucor*. P.M. examinations were made on 18 pigs which died (15 of them 5-7 months old) and 25 pigs emergency slaughtered. The gastric mucosa was swollen, hardened, intense red with haemorrhages and necrosis. The duodenum was swollen and hyperaemic and there were numerous petechiae. In the large intestine there were patches of hyperaemia and petechiae; also subserous oedema. Fungus-like structures were seen in histological sections of stomach and kidneys.—R.M.

✓ Christie, A. O. & Porteous, J. W. (1960). A technique for obtaining uniform inocula of *Actinomyces israelii*.—J. gen. Microbiol. 23, 261-265. 362

Uniform suspensions were obtained by

stirring the cultures for 4 hours daily during the 3rd to 5th days of cultivation, with the aid of a magnetic stirrer.—R.M.

Bilai, V. I. [Edited by] (1960). [Mycotoxicoses of man and farm animals.] pp. 168. Kiev: Izdatel'stvo Akademii Nauk Ukrainskoi SSR. 8r55k. [In Russian.] 363

This is a collection of 20 papers by persons engaged in research on poisoning caused by fungal toxins in foodstuffs (with special reference to *Fusarium* species). The first seven deal with the characteristics and properties of toxic fungi. These are followed by seven papers on fungal poisoning in man and six on fungal poisoning in animals.

A. K. Sarkisov discusses the general features of alimentary mycotoxicoses in farm animals (pp. 124-132). On the subject of stachybotryotoxicosis S. M. Bakai describes mycological procedure for diagnosis (pp. 133-137) while A. F. Tkachenko describes an allergic test for horses (pp. 147-149). E. S. Shulyumov and others give an account of the condition in horses in Southern Ukraine (pp. 137-147) where 332 cases (half the horse population on 9 large farms) were observed between 1951 and 1957, and 179 died. The toxicological and pharmacological properties of sclerotia of *Claviceps paspali* are described by D. M. Gelovani on pages 150-154. Stachybotryotoxicosis was diagnosed in a hippopotamus and a European bison in a zoo by Tkachenko (pp. 155-160).—R.M.

Kurmanov, I. A. (1960). [Fusariotoxicosis in fowls.]—Veterinariya, Moscow No. 6 pp. 62-65. [In Russian.] 364

Sixty fowls of different ages were each given 25 or 50 g. oats infected with *Fusarium sporotrichiella*. Fasted birds became ill within 5-6 hours after eating the oats and a high proportion died 24 hours later. The main symptoms were depression and coma, with cyanosis of the comb. P.M. examination revealed characteristic catarrhal inflammation of stomach and intestine and small numbers of petechiae in the mucosa of the glandular part of the stomach. Those which survived for 2 or 3 days developed leucopenia and reduction in haemoglobin content of the blood. Birds not starved developed fatal chronic poisoning after inclusion of 25 or 50 g. infected oats in the ration daily for 5-8 days. Illness lasted for 15-20 days and was characterized by anaemia (pale comb) depression and diarrhoea. There was intense haemor-

rhagic inflammation of the mucosa of the glandular stomach and intestine and degenerative changes in heart muscle and liver.—R.M.

Shestak, S. S. (1960). [Rapid method for determining the toxicity of mouldy grain and meal.]—Veterinariya, Moscow No. 8 p. 67. [In Russian.] 365

Grain (50 g.) or meal (100 g.) is extracted with ether in Soxhlet's apparatus. One or two drops of the extract are added to 5 ml. of 2N alkali soln. and the mixture is shaken to obtain a smooth emulsion. Then 1 ml. ether is carefully poured down the test-tube to form a layer above the emulsion. Presence of toxin is indicated by the formation of a brown ring at the junction of ether and emulsion. This was stated to be due to fat-soluble cyclopentane perhydrophenathrene compounds present in species of *Fusarium*.—R.M.

Desrotour, J. & Itard, J. (1960). Épidémie de péripneumonie bovine dans l'ouest de la République Centrafricaine. Éradication de la maladie par association de mesures de prophylaxie sanitaire et médicale. [An epidemic of bovine contagious pleuropneumonia in Central Africa.] — Rev. Elev. 13, 43-52. [Summaries in English and Spanish.] 366

An epidemic in French Equatorial Africa affecting 35 herds of 3,500 zebu cattle was eradicated within 2 years by the establishment of a contaminated zone and a quarantine zone. Movements between the zones were prohibited, and all the cattle in the two zones were inoculated in the muzzle twice in 9 months with an avianized vaccine.—M.G.G.

Anon. (1960). Report of the first meeting of the joint FAO/OIE/CCTA expert panel on contagious bovine pleuropneumonia held at Melbourne, Australia 21-26 March 1960. pp. 37. Rome: Food & Agriculture Organization of United Nations. (Meeting Report AN 1960/3.) 367

Interest was centred on classification of the causal organism, diagnosis by complement fixation, and immunization. The meeting recommended further study of the c.f. test and the use of tube precipitin and gel diffusion tests for confirming field diagnosis; further work should be done on an allergic test. It suggested that living vaccines might be improved in various ways and that the search for a satisfactory inactivated vaccine should continue. The next meeting will be in 1963.—R.M.

Buttery, S. H. & Plackett, P. (1960). A specific polysaccharide from *Mycoplasma mycoides*. — *J. gen. Microbiol.* 23, 357-368. [Authors' summary modified.] 368

Washed suspensions of strain V5 of the organism of bovine contagious pleuro-pneumonia contained about 10% by weight of carbohydrate. The only sugars detected in hydrolysates were galactose and ribose. A galactin was obtained by extraction with warm aqueous phenol. It formed precipitates with specific antiserum and could be used to sensitize sheep erythrocytes to agglutination by the antiserum. It was not pyrogenic for rabbits and had little in common with the lipopolysaccharides of typical Gram-negative bacteria.

Shishkov, N. & Enchev, S. (1960). [Chronic respiratory disease of fowls in Bulgaria.] — *Vet. Sbir.*, Sofia 57, No. 9-10 pp. 7-10. [In Bulgarian.] 369

The disease was diagnosed for the first time in Bulgaria in 1958. It was apparently introduced by chicks imported from Austria and Israel. Strict control measures included slaughter of affected flocks.—R.M.

Popken, F. E., Clemente, J. & Kiser, J. S. (1960). An evaluation of various antibiotics against a *Mycoplasma gallinarum* infection in eggs. — *Antibiot. & Chemother.* 10, 565-571. [Summary in Spanish. p. 587.] 370

Seventeen antibiotics were tested for activity against strain "ASD" of PPLO isolated from a fowl with chronic respiratory disease. Antibiotic was injected into the allantoic cavity of eggs incubated for a week. Half an hour later 0.2 ml. of diluted yolk-sac suspension infected with strain ASD was inoculated into the yolk sac. Results were

See also absts: 444 (blood picture in Newcastle and pullorum disease); 509 (report, N. Ireland); 511 (pathology of acclimatization); 585 & 586 (reports, Australia); 587 (report, Swaziland); 588 (report, Basutoland); 589 (report, Sierra Leone); 591 (report, U.S.A.); 594 (book, mycology); 595 (book, farm animals in health and disease); 597 (book, diseases of wild animals); 602 (book, poultry breeding).

#### DISEASES CAUSED BY PROTOZOAN PARASITES

Yaeger, R. G. (1960). A method of isolating trypanosomes from blood. — *J. Parasit.* 46, 288. 373

Erythrocytes were removed from heparinized blood by adding a commercial preparation of phytohaemagglutinin. Trypanosomes in the supernatant fluid were concentrated by triple centrifugation.—R.M.

Mulvey, P. F., Jr. (1960). The uptake and fate of radioactive elements in *Trypanosoma*

assessed by the proportion of embryos born alive. The most potent antibiotics, effective in a dose of less than 0.2 mg. per egg, were carbomycin, leucomycin, erythromycin, spiramycin, demethylchlortetracycline, and a mixture of griseoviridin and viridogrisein.

—R.M.

Wiseman, R. F., Jacobson, D. R. & Miller, W. M. (1960). Persistence of lactobacilli and streptococci in the bovine rumen during penicillin administration. — *Appl. Microbiol.* 8, 76-79. [Authors' summary modified.] 371

Two clover-fed fistulated steers were given daily doses of penicillin (50 and 150 mg. per dose) over 2 weeks. No pronounced alteration in numbers of rumen lactobacilli, streptococci, or paracolon bacteria occurred during the period. This apparent lack of penicillin activity was not correlated with the appearance of penicillin-resistant lactobacilli or streptococci. The ability of the paracolon bacteria to inactivate relatively high concentration of penicillin *in vitro* suggests that these bacteria may be responsible for the inactivation of the penicillin in the rumen.

Prieur, W. D. (1960). Beitrag zur infektiösen Anämie der Katze. [Infectious anaemia in cats.] — *Kleintier-Praxis* 5, 87-89. [Summaries in English and French.] 372

Two cats brought for examination had severe anaemia. One died the following day, the other recovered after vitamin B therapy. Blood smears from a third cat with anaemia in the same district revealed *Eperythrozoon felis*. The cat recovered after treatment with oxytetracycline, B vitamins and iron, and on the 6th day *E. felis* could not be demonstrated.

—M.G.G.

*equiperdum*. — *J. infect. Dis.* 107, 155-159. [Author's summary modified.] 374

Uptake and release of radiosodium and radiophosphorus by *T. equiperdum* in a glucose-free medium appears to be by diffusion. In the presence of glucose, the uptake and release of both isotopes appears to be an active process.

The optimum temperature for radio-iron accumulation in a glucose medium appears to be 27°C. As the concentration of organisms

increases, the uptake of radiosodium per organism decreases.

Gualandi, G. & Zanella, A. (1959). Preparazione ed uso di un terreno liofilizzato per l'isolamento e coltura del Trichomonas foetus. [A freeze-dried medium for *Trichomonas foetus*.]—Atti Soc. ital. Sci. vet. 13, 754-757. [Summaries in English, French and German.]

375

The medium consists of: L-cystine, 0.75 g.; yeast autolysate, 5 g.; peptone, 15 g.; sodium thioglycolate, 3 g.; agar, 1 g.; these are dissolved in 200 ml. double distilled water at 120°C. for 10 min. and pH is adjusted to 7.2. After freeze-drying, an antibiotic mixture is added. The following solution, pH 7.2, is used as diluent: peptone, 1 g.; yeast autolysate, 0.5 g.; glucose, 0.1 g.; para-aminobenzoic acid, 0.005 g.; double distilled water, 100 ml. This medium is considered satisfactory for the demonstration of *Tr. foetus* in the laboratory and in the field.

—T.E.G.R.

Reshetnyak, V. Z., Pakhomova, N. G. & Skripkina, N. A. (1960). [Importance, aetiology and treatment of trichomoniasis in poultry.]—Veterinariya, Moscow No. 9 pp. 41-44. [In Russian.]

376

Diarrhoea among young ducks, geese and fowls assumed epidemic proportions in 1959 in the Novocherkassk area. Examinations for spirochaetes, coccidia, helminths and paratyphoid were negative. Between 50 and 75% of adult ducks and geese were carriers of trichomonads. The organisms did not appear to survive longer than 2 hours in water troughs. Losses were heaviest in birds aged 30-45 days. Although there were no morphological differences between trichomonads obtained from each species of bird, each was species-specific. The disease occurred more often under conditions of poor feeding and management. Many thousands of birds were treated with acriquine (mepacrine) or amino-acriquine at 50 mg./kg. body wt. or with rivanol at 10 mg./kg. with good results.

—R.M.

Medda, A. (1960). La terapia e la profilassi della coccidiosi caprina da *Eimeria arloingi*, Marotel 1905. [Therapeutic and prophylactic treatment of coccidiosis in goats.]—Veterinaria, Milano 9, 202-205. [Summaries in English, French, German, Spanish and Portuguese.]

377

Mortality ceased when phenothiazine

(0.15 g./kg. body wt.) or the sodium salt of sulphaquinoxaline, 3.44% (5 ml./animal) was administered for 3 periods of 3 days each at intervals of 3 days. No relapses occurred when the dose was repeated once a week until weaning. Burning of the litter and disinfection of the goat house by means of a blow lamp are considered effective preventive measures.—T.E.G.R.

Johnson, C. A. (1960). Nitrofurazone in water for cecal coccidiosis in chickens.—Poult. Sci. 39, 1076-1079. [Author's summary modified.]

378

Nitrofurazone concentrations below 0.005% in drinking water were not effective in caecal coccidiosis. At 0.01 to 0.02% the drug was apparently toxic as growth rate was depressed. At a concentration of 0.008% the drug was highly effective against the infection, when medication started not later than 3 days after inoculation. Prophylactically, the drug proved effective at 0.004, 0.005 and 0.006%, with no adverse effect on growth.

Greuel, E. (1960). Vergleichende Untersuchungen über die Wirkung verschiedener Kokzidiosemittel unter Berücksichtigung hygienischer Massnahmen. [Comparison of "Cordinal" and sulphaquinoxaline therapy in coccidiosis under different hygienic conditions.]—Dtsch. tierärztl. Wschr. 67, 45-47. [Summary in English.]

379

Two coccidiostatic drugs, given in the drinking water, were tested in 293 cockerels. "Cordinal", a combination of *p*-toluol-sulphonylmethoxyethyl urethane and tetracycline, was more effective than "Novococcin", a sulphaquinoxaline preparation. Both drugs were superior to nitrofurazone.—E.G.

Schwarz, I. & Hohner, L. (1960). Der Nachweis von Kokzidienoocysten mittels Farbtest nach Ziehl-Neelsen. [Demonstration of coccidial oocysts by Ziehl-Neelsen staining.]—Tierärztl. Umsch. 15, 185-186.

380

A rapid, reliable method of demonstrating *Eimeria* oocysts in smears and crush preparations of organs was by staining with carbol fuchsin and methylene blue.—M.G.G.

Raethel, H. S. (1960). Plasmodieninfektionen bei Pinguinen des Berliner Zoologischen Gartens und ihre Bedeutung für die Pinguinhaltung. [Plasmodium infection in penguins in Berlin zoo.]—Kleintier-Praxis 5, 64-70. [Summaries in English and French.]

381

P.M. examination of 2 penguins that died

in August of 1957 and 1958 revealed massive *Pl. relictum* infection, with enlargement of the spleen and liver, congestion of the lungs, and numerous schizonts in reticulo-endothelial cells and erythrocytes. Mild plasmodium infection was seen in a penguin that died in December from degeneration of the myocardium.

—M.G.G.

Barnett, S. F., Brocklesby, D. W. & Vidler, B. O. (1960). A note on the susceptibility of East African cattle to infection with *Theileria annulata*.—Bull. epiz. Dis. Afr. 8, 127-129. [Summary in French.] 382

Blood containing a strain of *Th. annulata* was taken to Kenya from Israel, and three days after bleeding, 50 ml. were injected subcutaneously and 50 ml. intravenously into a four-month-old zebu calf and into an adult grade steer. The strain was maintained by mechanical transmission for 10 passages in adult grade cattle. Fifteen cattle were infected with *Th. annulata* and three died. Schizonts were present for only a few days and intra-erythrocytic organisms were not seen. The parasite was not infective for ticks (*H. dromedarii*). Recovery from *Th. annulata* infection did not result in immunity to *Th. parva* infection.—B. M. WILSON.

Bailey, K. P. (1960). Notes on the rearing of *Rhipicephalus appendiculatus* and their infection with *Theileria parva* for experimental transmission.—Bull. epiz. Dis. Afr. 8, 33-43. [Summary in French.] 383

B. discussed the technical problems of rearing ticks in incubators and feeding them on the ears of rabbits, and of infecting ticks with *Th. parva* by placing nymphs on the ears of infected cattle.—R.M.

Lavrent'ev, P. A. (1960). [Berenil for theileriasis and piroplasmosis in cattle.] — Veterinariya, Moscow No. 8 pp. 21-22. [In Russian.] 384

Marutyan, E. M. (1960). [Therapeutic and prophylactic efficacy of Berenil in theileriasis and piroplasmosis of cattle.]—Ibid. pp. 22-23. [In Russian.] 385

Evplov, N. N., Tiga, N. N. & Mironenko, V. I. (1960). [Berenil for piroplasmosis in cattle.]—Ibid. p. 24. [In Russian.] 386

The efficacy of this drug against *Babesia bigemina* and *Francaiella colchica* infections was confirmed. It was ineffective in *Theileria annulata* infection.—R.M.

Catarsini, O. & Compagnucci, M. (1960). Ricerche sulla toxoplasmosi sperimentale del cane. Nota II. Ricerche ematologiche. [Experimental toxoplasma infection in dogs. II. Blood changes.]—Zooprofilassi 15, 191-196. 387

In 10 adult dogs i/p or i/v injection of *Toxoplasma gondii* did not cause clinical manifestations or significant changes in the blood picture. In 3 of 10 young dogs it caused acute infection (with death in 7-10 days) and changes in the blood picture: increase in r.b.c., lymphopenia, neutrophilia, eosinopenia, etc. Similar, though less marked changes occurred in survivors during the first few days after inoculation.—T.E.G.R.

Makstenieks, O., Verlinde, J. D. & Ris, A. (1960). Over het epidemiologisch verband tussen toxoplasmosis bij de hond, de kat en de mens. [Epidemiological relationship between toxoplasmosis in dog, cat and man.]—Tijdschr. Diergeneesk. 85, 781-794. [In Dutch. Summaries in English, French and German.] 388

Pets (31 dogs and 34 cats) in the households of human cases of toxoplasmosis were examined serologically and in addition a check was made on 61 persons in contact with infected dogs. The results were compared with tests on apparently healthy animals and persons selected at random. The incidence of recent toxoplasmosis in human contacts with infected dogs was much higher than in persons selected at random. There was no obvious connexion between human and feline infection. The chief symptoms of infected dogs and cats were cerebral, gastrointestinal, ocular and muscular. A preliminary account of this work was published in English in *Docum. Med. geogr. trop.* 9, 213 (1957).

—R.M.

Seeman, J. & Smetana, M. (1960). Sérologické nálezy toxoplasmických protilátek u pracovníků na Pražských jatkách. [Toxoplasma antibodies in abattoir workers in Prague.]—Veterinářství 10, 222-223. [In Czech.] 389

Toxoplasma antibodies were demonstrated by the c.f. test in 32 of 98 veterinarians, veterinary auxiliaries and butchers of the Prague abattoir, using as antigen peritoneal fluid from infected mice. [See also *V.B.* 30, 3554.]—E.G.

Pipkin, A. C. (1960). Avian embryos and tissue culture in the study of parasitic protozoa. II.

**Protozoa other than Plasmodium.** — Exp. Parasit. 9, 167-203. 390

In this review the applications of chick embryos and tissue culture in research on extra- and intracellular protozoa are discussed. Chick embryos have shown promise in the study of blood parasites, particularly trypanosomes, though further application is indicated in the case of *Leishmania*; growth of amoebae of vertebrates has not been promising. Careful assessment of the infectivity (and resulting lesions, if any) in chick embryos is indicated. With regard to tissue culture methods it is considered that, while they have been applied extensively in research on protozoa, particularly trypanosomes, their further use should prove profitable. Extension of studies on the metabolism of obligate intracellular protozoa is advocated. Data on cultivation of trypanosomes of mammals in chick embryos and in tissue culture are presented in tabular form.

—T.E.G.R.

Coleman, G. S. (1960). Effect of penicillin on the maintenance of rumen oligotrich protozoa.—Nature, Lond. 187, 518-520. 391

The substrate consisted of 3-4 ml. quantities of mineral salt solution, 6 mg. dried grass, and 0.2 ml. 10% "Difco" yeast extract. After autoclaving, the following additions were made: 0.2 ml. 1% L-cysteine hydrochloride, 0.2 ml. 5% sodium bicarbonate, 0.25

ml. 6% rice starch, 0.8 ml. protozoa-containing autoclaved rumen fluid and 10,000 U penicillin G. These tubes of culture were inoculated, filled with the mineral salt solution, sealed up and incubated at 38°C. The initial number of protozoa (more than 90% *Entodinium caudatum*) for each inoculum was 3,000-20,000/ml. In subsequent experiments inocula of 2,000-40,000 protozoa/ml. were used. In all experiments the number of protozoa increased for 3-7 days, and then decreased steadily until they were usually dead by the 12th-14th day. Omission of the yeast extract of protozoa-containing autoclaved rumen fluid reduced or prevented the growth of the protozoa although they remained alive for up to 7 days. The number of viable bacteria in the complete protozoal culture containing the protozoa was  $10^3$ - $10^5$ /ml. but in half of the experiments the number was  $10^6$ - $10^7$ /ml. In all the experiments the rice starch was metabolized slowly, probably because the penicillin inhibited growth of the starch-digesting bacteria, and starch remained for the protozoa to engulf and metabolize. Thus the number of viable bacteria can be reduced to 1%. Further experiments are being carried out to reduce this value lower still, and to produce protozoa that contain no bacteria.

Addition of fresh rumen fluid to protozoa culture which was declining in numbers, caused a resumption of growth of the protozoa.—B. M. WILSON.

See also absts: 509 (report, N. Ireland); 585 & 586 (reports, Australia); 587 (report, Swaziland); 589 (report, Sierra Leone); 590 (report, Bahamas); 595 (book, farm animals in health and disease); 597 (book, diseases of wild animals); 602 (book, poultry breeding).

## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Moosbrugger, G. A. (1960). La prévention de l'introduction dans un pays des types de virus qui y sont encore totalement inconnus et l'organisation, par régions, de la lutte anti-aphteuse. [Prevention of the entry of new types of foot and mouth disease virus into a country and regional organization of control campaigns.]—Bull. Off. int. Epiz. 53, 809-832. 392

The problems caused by the entry of a new type of F. & M. disease virus into a country were discussed: delays in diagnosis, insufficient stocks of suitable vaccine, public resistance to the slaughter policy, disorganization of the economy by the restriction of movements, and lack of finance and equipment. The advantages of regional as opposed to national organization of control campaigns were discussed.—M.G.G.

Boiko, A. A. (1960). [Eradication of foot and mouth disease—an urgent task.] — Veterinariya, Moscow No. 8 pp. 10-16. [In Russian.] 393

In the Soviet Union there were two recent epidemics of F. & M. disease in 1941-42 and 1952-53. From 1954 onwards the number of outbreaks has remained constant (absolute figures not given). The disease is endemic in the Central Asian republics and great reliance is placed on vaccines to prevent spread. Slaughter of infected cattle in clean districts is resorted to (since January 1958) only when isolated animals or fat stock are affected. Mass slaughter of productive livestock is regarded as uneconomic and is prohibited. The number of animals vaccinated in 1959 was 72.2 million of which 63.1 million were cattle. Apart from field trials of other vaccines, killed aluminium

hydroxide vaccine prepared by the V.I.E.V. [All-Union Institute for Experimental Veterinary Science] method was employed. Production of virus from animals at abattoirs has been stopped and it is now prepared by culture. Work is in progress on lapinized virus vaccine. During 1959 over 700,000 cattle, 100,000 sheep and 15,000 pigs in Belgorod region were inoculated s/c with monovalent aluminium hydroxide lapinized killed vaccine while in Dnepropetrovsk region 2 million cattle, 12,000 sheep and 13,000 pigs were inoculated with satisfactory results; it was also used in other parts of the U.S.S.R., and B. summarized the results. Control measures (including vaccination) led to the eradication of the disease from Transcarpathia in 1959.—R.M.

Fogedby, E. G., Malmquist, W. A., Osteen, O. L. & Johnson, M. L. (1960). **Air-borne transmission of foot-and-mouth disease virus.** —Nord. VetMed. 12, 490-498. [In English. Summaries in German and Danish.] 394

In 3 out of 4 trials with 40 cattle, F. & M. disease developed in 4-6 days in 5 cattle exposed to a continuous air current from a unit containing 5 infected cattle about 10 metres away. It is considered that the virus can be carried by strong winds from northern Germany to the Danish islands and from Denmark to Sweden and Norway.—M.G.G.

Pilz, W. & Garbe, H. G. (1960). **Die Eignung von Formaldehyd-Lösung zur Desinfektion MKS-verseuchter Eisenbahnviehtransportwagen. [Formaldehyde disinfection of railway cattle trucks infected with foot and mouth disease virus.]** —Mh. Tierheilk. 12, 190-193. 395

A railway truck contaminated with types O, A and C of F. & M. disease virus was sprayed with 30 litres of 0.4% or 1% formaldehyde soln. in cold tap water (14°C.) containing a wetting agent. Susceptible cattle and pigs introduced 2-3 hours later remained healthy after spraying with 1% but not always after 0.4% formaldehyde.—M.G.G.

Brown, F. (1960). **A beta-globulin antibody in the sera of guinea pigs and cattle infected with foot-and-mouth disease.** —J. Immunol. 85, 298-303. [Author's introduction.] 396

The occurrence in the sera of cattle recovering from F. & M. disease of precipitating antibodies which have different mobilities in an electric field has been described briefly by Brown & Graves [V.B.

30, 94]. The mobility of the precipitating antibody present 7 days after infection suggested that it was a  $\beta$ -globulin. The work presented in this paper lends support to this suggestion and shows that there is a similar marked change in mobility of the precipitating antibodies present in guinea-pig sera during convalescence from the disease.

Brown, F. & Cartwright, B. (1960). **Purification of the virus of foot-and-mouth disease by fluorocarbon treatment and its dissociation from neutralizing antibody.** —J. Immunol. 85, 309-313. [Authors' summary modified.] 397

Treatment of suspensions of F. & M. disease virus with Arcton (a fluorinated hydrocarbon) eliminates the 7  $m\mu$  component without reducing the infectivity titre.

The immunogenicity of vaccines prepared from virus suspensions and Arcton-treated suspensions is the same, indicating that there is no loss of 20  $m\mu$  component.

Neutral mixtures of virus and antiserum can be dissociated with excellent recovery of virus infectivity.

Zavagli, V., Mazzaracchio, V., Fontanelli, E., Orfei, Z., D'Amore, A., Ravaoli, L. & Castagnoli, B. (1960). **Nouveau vaccin anti-aphteux pour la prophylaxie de la fièvre aphteuse des bovins au moyen de virus produit sur cellules rénales monostratifiées. [Vaccine against foot and mouth disease prepared from virus grown on monolayers of kidney cells.]** —Bull. Off. int. Epiz. 53, 657-665. 398

A vaccine prepared from type C virus grown on monolayers of kidney cells was injected into 37 cattle. Of 35 challenged between 2 and 13 months later only one developed lesions of F. & M. disease, without generalization, but of the 2 challenged in the 14th month, both developed local lesions. All of 270 unimmunized control cattle developed characteristic lesions after challenge. [See also V.B. 29, 3809.]—M.G.G.

Sergeev, V. A. (1960). [Immunizing and interfering properties of foot and mouth disease virus grown in cultures of calf kidney cells.] —Voprosy Virusologii 5, 479-484. [In Russian. Summary in English.] 399

A porcine strain of Type A virus was used. Alternate passage between tissue culture and cattle (a total of 33 passages in culture and 3 in cattle) did not affect its immunizing potency. After passage through cattle,

cultured virus lost its cytopathic action on kidney cells, and this was believed to be due to acquisition by the virus of non-cytopathic particles.—R.M.

Varenne, H. (1960). Le problème de la vaccination anti-aphteuse chez le porc. Essais et résultats de la méthode intra-dermique. [Immunization of pigs against foot and mouth disease by the intradermal route.]—Bull. Off. int. Epiz. 53, 793-808. 400

Outbreaks of F. & M. disease endangering 5,000 pigs were checked by i/d inoculation of all the animals with vaccines against types O, A and C [see also *V.B.* 28, 2120]. Twelve pigs exposed s/c or orally to 2 ml. of virulent virus 25 days after i/d immunization remained healthy except for a benign inflammation of the coronets.—M.G.G.

I. Uhlmann, W. (1960). Untersuchungen über die Virämie bei erwachsenen Mäusen nach der intraperitonealen Injektion von Maul-und-Klauenseuche-Virus verschiedener Herkunft. [Viraemia in adult mice after intraperitoneal injection of foot and mouth disease virus.]—Mh. Tierheilk. 12, 79-92. 401

II. Uhlmann, W. (1960). Versuche zur Charakterisierung einzelner Stämme des Maul-und-Klauenseuche-Virus mit Hilfe des Virämietestes an der erwachsenen weißen Maus. [Differentiation of strains of foot and mouth disease virus by a viraemia test on adult mice.]—Ibid. 93-101. 402

I. The time of appearance of viraemia in adult mice inoculated i/p with F. & M. disease virus depended on the strain of virus and previous method of cultivation, and on the dose. Virus multiplication reached its peak between 24 and 36 hours after infection. II. Adult mice were inoculated s/c with F. & M. disease virus and 14 days later challenged with different strains i/p. With viraemia as the criterion of susceptibility, the tests revealed immunological differences between three O variants and, to a lesser degree, between four C strains.—M.G.G.

Brown, F. & Stewart, D. L. (1960). The influence of proflavine on the synthesis of foot-and-mouth disease virus.—J. gen. Microbiol. 23, 369-379. 403

This paper gives details of and extends work already reported [*V.B.* 30, 1018].—R.M.

Rice, C. E. (1960). The use of the complement-fixation test in the study and diagnosis of viral diseases in man and animals.—A review.

III. Vesicular viruses.—Canad. J. comp. Med. 24, 204-208 & 238-241. 404

The review deals with the extensive use of the complement-fixation test in the diagnosis of vesicular virus diseases in man and animals.

In foot and mouth disease precise quantitative methods have been developed for typing of strains and for analysis of antigenic differences within types. The same tests are also commonly employed in conjunction with potency tests in the manufacture of vaccine.

Such tests are also important in the routine diagnosis of vesicular exanthema in swine and vesicular stomatitis in various animal species.

In human vesicular diseases this serological method has proved of value in detection and differentiation of the two herpes agents, and has contributed much evidence of the antigenic relationship between herpes zoster and varicella viruses.

—R. V. L. WALKER.

Gavrilov, V. I. (1960). [Cultivation of two lines of sheep kidney cells. II. Susceptibility to some viruses.]—Voprosy Virusologii 5, 416-421. [In Russian. Summary in English.] 405

Aujeszky's disease virus and some human viruses had cytopathic action on the cells. Addition of penicillin, streptomycin or nystatin to cultures did not interfere with either adherence of the cells to glass or formation of a confluent layer.—R.M.

Kauker, E. & Zettl, K. (1960). Der Verlauf der Tollwut in der Bundesrepublik im Jahre 1959. [Rabies in the German Federal Republic during 1959.]—Berl. Münch. tierärztl. Wschr. 73, 166-171. [Summary in English.] 406

Rabies was found in 2,150 wild and domestic animals in 1959, compared with 1,569 in 1958, an increase of 37.6%. Foxes accounted for 65.6% of the cases. In Baden-Württemberg 34,000 foxes and 11,000 badgers were shot in the second half of 1959, to prevent the disease from spreading into the Black Forest. [A French version of this was published in *Bull. Off. int. Epiz.* 53, 1115-1117.]—M.G.G.

Anon. (1960). Expert committee on rabies. Fourth report.—Tech. Rep. World Hlth Org. No. 201 pp. 28. 1s. 9d. 407

This is the report of a meeting in Geneva in December 1959. There are comments on

diagnosis by complement fixation and the fluorescent antibody technique, and on vaccines currently available. The vaccine recommended for dogs above 3 months of age was the Flury strain of low egg passage (LEP); a strain of high egg passage (HEP) should be used for puppies, or the Kelev strain. Cats may be effectively immunized with the old type of nervous-tissue vaccine, or Flury HEP virus at half the dog dose; LEP virus should not be used. The best vaccines for cattle were the Kelev strain and Flury HEP virus; for protection after exposure, 14 daily inoculations of 1.5-2 g. wet wt. of inactivated nervous-tissue vaccine appeared to give good results, but the method was too expensive for ordinary use. The committee was unable to recommend vaccines for other species of animal because not enough was known about their susceptibility to live vaccines. Rabies control was discussed, with reference to wild carriers. Attempts should be made to develop a tissue culture system that would reveal a cytopathic action of the virus and support virus growth to a high titre.—R.M.

Fenje, P. (1960). Propagation of rabies virus in cultures of hamster kidney cells.—Canad. J. Microbiol. 6, 479-484. [Author's abst. modified.] 408

A strain of rabies fixed virus has been cultivated in tissue cultures of hamster kidney cells. This confirms an earlier report by Kissling [V.B. 28, 3942]. A special culture tube incorporating a dialyzing membrane made it possible to maintain the cells in continuous culture for many weeks and to obtain culture fluids of high infectivity.

Schindler, R. (1959/60). Untersuchungen über die Bedeutung eines bei Karnivoren vor kommenden Speichel faktors mit Hyaluronidase-ähnlicher Wirkung für die Übertragung der Tollwutinfektion. I & II. [Role in the transmission of rabies of a factor similar in action to hyaluronidase, present in the saliva of carnivora. I & II.]—Z. Tropenmed. u. Parasit. 10, 450-476 & 11, 71-109. 409

In experiments on the effect of hyaluronidase on the course of experimental rabies due to fixed or street viruses, it was shown that it increased mortality and shortened the incubation period. Its action was, however, confined to tissues outside the c.n.s. Injection of histamine into the site of infection appeared to inhibit the action of the virus, but injection into a different place enhanced

the spreading action of hyaluronidase. A hyaluronidase-like factor was found to be present in the salivary glands of carnivorous, but not herbivorous or other animals. Experiments appeared to indicate that rabies virus itself may produce hyaluronidase.—E.G.

Böhm, H. (1960). Zur Inaktivierung des Virus fixe "Novi Sad". [Inactivation of rabies fixed virus, Strain "Novi Sad".]—Mh. Tierheilk. 12, 150-156. 410

The strain was inactivated by adding 0.04% formol and heating at 56°C. for 3 hours.—M.G.G.

Falke, D. (1960). Versuche zur Reinigung von S-Antigen des Tollwut-Virus. [Purifying the soluble antigen of rabies virus.]—Mh. Tierheilk. 12, 181-187. 411

Diagnosis of rabies by the complement-fixation test on serum was improved by first concentrating the antigen. Suitable methods were ultracentrifugation or precipitation with ammonium sulphate soln. at 4% saturation. Precipitation by citric acid at pH 5 halved the complement-fixing activity of antigen.—R.M.

Olechnowitz, A. F. & Kuwert, E. (1960). Zur Lokalisation der Antikörper in den Proteinfraktionen des rabiziden Hundehyperimmunsers. [Localization of rabies antibodies in the protein fractions of hyperimmune serum from dogs.]—Arch. exp. VetMed. 14, 1073-1076. 412

Most of the neutralizing antibody was present in the gamma-globulin fraction. All of the complement-fixing antibody was present in this fraction.—R.M.

Sulkin, S. E., Allen, R., Sims, R., Krutzsch, P. H. & Kim, C. (1960). Studies on the pathogenesis of rabies in insectivorous bats. II. Influence of environmental temperature.—J. exp. Med. 112, 595-617. [Part of authors' summary.] 413

Studies on Mexican free-tailed bats (*Tadarida mexicana*) and little brown bats (*Myotis lucifugus*) provided evidence that little or no viral multiplication occurs in the inactive host during experimentally induced hibernation. When inoculated animals are wakened from hibernation by transfer to a warm room, rabies virus previously in "cool storage" multiplies, reaching detectable levels in various tissues.

Hausler, W. J., Jr. & Dick, E. C. (1960). The purification and concentration of influenza A virus (PR8) by a method of continuous

**extraction with glycine of a zinc-virus precipitate.**—J. infect. Dis. 107, 189-194. 414

The present investigation alters the method of Metcalf [J. infect. Dis. 101, 40 (1957)] by employing a procedure of continuous extraction with glycine rather than repeated extractions.—R.M.

I. Libiková, H. & seven others (1960). **Incidence of antibodies against tick-borne encephalitis virus in man and domestic animals in a small village in a natural focus of infection.**—J. Hyg. Epidem. Microbiol. Immunol., Prague 4, 327-332. [In English. Summaries in French and German.] 415

II. Korych, B. (1960). **Cultivation of tick-borne encephalitis virus with cytopathic changes in stable-line pig kidney epithelium cells.**—Ibid. 333-340. [In English. Summaries in French and German.] 416

I. Neutralizing antibodies were found in sera from 34 of 191 human beings, 16 of 49 goats, 41 of 174 sheep, 4 of 98 young cattle and 49 of 98 adult cattle in Slovakia. The milk of infected animals was an important source of human infection, although animals having neutralizing antibodies in their blood probably did not excrete virus in the milk.

II. Pig kidney cultures were suitable for demonstration of cytopathic effect and for neutralization tests.—R.M.

Anon. (1960). **The arthropod-borne viruses.**—Rep. med. Res. Coun., Lond. 1958-1959 pp. 67-72. 417

Whereas ten years ago the isolation of a new virus in the Tropics was something of an achievement, it is now almost an embarrassment, and most tropical laboratories have several new or unexamined viruses under deep-freeze conditions awaiting study. During 1959, 116 arthropod-borne viruses were isolated throughout the world. Identification has been simplified by haemagglutination inhibition tests.—R.M.

Aleraj, Z., Tunkl, B., Audi, S. & Topolnik, E. (1960). Virusni stomatitis goveda. [Virus stomatitis in cattle in Yugoslavia.]—Vet. Arhiv 30, 117-123. [In Croat. Summaries in English and French.] 418

The clinical picture of virus stomatitis in cattle is described. In the early stages it may be mistaken for foot and mouth disease. It occurred in calves and young heifers, never in adult cattle. Recovery was, as a rule, within 6-8 days. Specific antibodies were demonstrable in convalescents. The virus was

successfully passaged in chick embryos and transmitted to calves. Mice, rabbits, g.pigs, swine, lambs, goats and horses, resisted infection.—E.G.

I. Boháč, J. (1960). **Virové pneumonie telat, etiologie a diagnostika. [Aetiology and diagnosis of virus pneumonia in calves.]**—Veterinářství 10, 81-82. [In Czech.] 419

II. Polóny, R., Vrtiak, O. J., Pleva, J. & Koppel, Z. (1960). **Výskyt neorickettsií pri bronchopneumóniach telieci na východnom Slovensku. [Presence of neorickettsia in calf bronchopneumonia in Slovakia.]**—Ibid. 82-85. [In Slovak.] 420

III. Balaščák, J., Gregor, B., Koppel, Z., Opletal, J., Pecháč, O., Rencz, K., Vasil', M. & Vozarik, J. (1960). **Terénné skúsenosti s infekčnou bronchopneumóniou teliat v Prešovskom kraji. [Infectious bronchopneumonia in calves in Slovakia.]**—Ibid. 85-87. [In Slovak.] 421

I. From lung material of calves with pneumonia, a comparatively large virus, provisionally classified as belonging to the "neorickettsia" group was isolated. It destroyed ox kidney cells in tissue culture, was pathogenic for chick embryos and to a lesser extent for g.pigs and mice. In cattle the clin. picture of natural infection was, however, not reproducible by infection with culture virus.

II. About 50% of g.pigs were killed by this virus, isolated from lung, spleen and liver of calves with bronchopneumonia.

III. Based on material collected in outbreaks of calf pneumonia in various parts of Slovakia, the authors discussed the clin. picture, P.M. appearance and probable "neorickettsial" aetiology of the disease and remarked on the resemblance to porcine enzootic bronchopneumonia. [See also V.B. 30, 3576.]—E.G.

Dinter, Z. (1960). **Laboratoriediagnostik vid akuta virussjukdomar hos nötkreatur. [Laboratory diagnosis of Ume-disease, an acute virus disease in cattle.]**—Medlemsbl. Sverig. VetFörb. 12, 447-448. [In Swedish.] 422

Further work on "Ume-disease" [see V.B. 30, 3255] is reported. A cytopathic strain of the virus diarrhoea agent, isolated in tissue culture in the U.S.A., was used in tests on cattle sera from Umeå. Those taken at a later stage of Ume-disease or from convalescent cattle contained, in addition to antibodies against parainfluenza-3 virus, antibodies against the virus diarrhoea agent; samples taken at earlier stages were as a rule

negative. The two viruses were therefore involved (and this would explain the dual syndrome).—F.E.W.

Bakos, K. & Dinter, Z. (1960). Antikörperreaktion des Rindes auf die Infektion mit dem Virus der Parainfluenza 3. [Antibody reaction of cattle to infection with para-influenza 3 virus.]—Zbl. Bakt. I. (Orig.) 180, 1-11. [Summaries in English, French, Spanish and Russian. English summary modified.] 423

Only two out of 41 cattle herds presumed to be infected with para-influenza 3 virus proved to be devoid of antibodies against this virus. These two herds suffered from diarrhoea. Within the other herds respiratory symptoms were mainly prevalent.

Two hundred of 244 animals (82%) of these 41 herds had antibodies. Sera from healthy cows and young calves slaughtered in four different parts of Sweden were examined. No data about previous diseases were available. About 70% of the cows and about 50% of the calves showed positive reactions.

Medium to high antibody titres were prevalent among adult cattle and low to medium titres among young calves.

Experimentally infected calves developed fever and rhinotracheitis very similar to that seen in field cases. Antibody response to experimental infection was prompt and reached high titres, which lasted for more than two months.

Bögel, K. & Mussgay, M. (1960). Isolierung und Charakterisierung eines Enterovirus des Rindes. [Isolation and properties of an enterovirus from cattle.]—Zbl. VetMed. 7, 534-552. [Summaries in English, French and Spanish.] 424

A cytopathic virus was isolated from the faeces of one of a group of calves with an acute respiratory disease. It was excluded as the cause of the disease, on account of the behaviour of the calves' neutralization titres against the virus, and because the disease could not be reproduced experimentally. But blood-stained faeces were seen when calves that had been deprived of colostrum were infected. Neutralizing antibodies against the virus were demonstrated in cattle sera from the local abattoir. The virus differed serologically from ECBO LC R4 virus, and was not pathogenic for baby mice and non-pregnant rabbits and g.pigs, but caused abortion in pregnant g.pigs. The following criteria were proposed for the definition of an entero-

virus of cattle: predilection for the digestive tract, pathogenicity for calf kidney cells, size of up to 35 m $\mu$ , and resistance to chloroform.

—M.G.G.

Sigurdsson, B., Thormar, H. & Pálsson, P. A. (1960). Cultivation of Visna virus in tissue culture. — Arch. ges. Virusforsch. 10, 368-381. [In English. Authors' summary modified.] 425

The virus of "Visna", a slow, demyelinating leucoencephalitis of sheep, was grown in cultures of cells derived from the choroid plexus of sheep. The virus caused characteristic cytopathic changes in the culture. Virus which had undergone 3, 11 and 12 passages in culture was injected intracerebrally into sheep and found to produce typical "Visna" lesions.

Neutralizing antibody has been detected in sera from a certain proportion of sheep affected with "Visna".

Inoculation of tissue culture with a small dose of virus gave rise to a mild infection which persisted in the culture for a long time without destroying many cells.

The possible relationship between this relatively stable balance between virus and cells and the extraordinarily slow progress of "Visna" in the c.n.s. of sheep is discussed.

Kulesko, I. I. & Sobko, A. I. (1960). [Agar gel diffusion test for the diagnosis of swine fever.]—Veterinariya, Moscow No. 10 pp. 68-73. [In Russian.] 426

At the Ukrainian research institute for experimental veterinary science, the pancreas was collected from 183 pigs experimentally infected with the Chinese "Shi-min" strain of swine fever virus, and also from 120 healthy slaughtered pigs. Chloroform extract of the gland was used as antigen and serum from hyperimmunized rabbits was used as antibody in the agar plate precipitin test. Pancreas from 175 (95.4%) of infected pigs and from 29 (24%) of the healthy pigs gave a positive result. Many of the healthy pigs had been inoculated with swine fever vaccine. Pancreas from pigs inoculated with lapinized virus also gave a positive test quite often. Immune serum from 8 rabbits was used as antibody, and a large proportion of positive tests among healthy pigs were obtained with two of these sera.

The test was next tried on pancreas from pigs on 35 farms: on 22 of these (group 1) swine fever had been confirmed; on 4 (group 2) atypical infection was suspected among

young pigs but biological tests were negative; on 9 (group 3) swine fever was absent but there were other infections—Aujeszky's disease, gastro-enteritis, foot and mouth disease, paratyphoid, oedema disease. On group 1 the gel diffusion test was positive in 76 of 83 cases; on group 2 in 26 of 30 cases while on group 3, 13 of 59 tests were positive and the positive samples came from pigs with an infectious gastro-enteritis.

Urine was tried as an antigen for the test. It was collected from 131 pigs infected with the "Shi-min" strain 1-7 days previously and from 65 healthy pigs. Positive tests were obtained in 25 of 55 pigs infected 1-4 days previously and in 68 of 76 pigs infected 5-7 days previously, while 6 of the 65 healthy pigs gave positive tests. Tests on urine from naturally infected pigs were positive in 26 of 34 cases.

The agar plates prepared by the authors had 6 or more holes 0.9 cm. apart. When serum from infected pigs was used as antigen a second precipitin line appeared after the 2nd or 3rd day and became distinct after the 5th or 7th day, regardless of whether the "Shi-min" strain or a local strain of low virulence was used to infect the pigs. This second precipitin line indicated swine fever infection, since sera from healthy pigs gave one line only and all of 35 sera from infected pigs gave two lines.—R.M.

Airapetyan, V. G. & Khachatriyan, A. B. (1960). [Susceptibility of rabbits to swine fever virus.] — Voprosy Virusologii 5, 484-487. [In Russian. Summary in English.] 427

Workers at the Armenian veterinary research institute showed that the virus could be passed many times in rabbits aged 3-4 days without losing its virulence.—R.M.

Sakanyan, S. S. (1960). [Role of the functional state of the cerebral cortex in the development of post-vaccinal immunity to swine fever.] — J. Microbiol., Moscow No. 10 p. 101. [In Russian.] 428

Pigs aged 4-6 months were inoculated with crystal violet-glycerin vaccine. Inhibition of brain function was brought about by bromide given orally and stimulation by caffeine subcutaneously. It is not clear when these drugs were administered and how many doses were given, but large doses (0.6 g. or more of caffeine; 0.3 g./kg. or more of bromide) did not permit immunity to become established. Moderate doses (0.1-0.4 g. caffeine; 0.1-0.2 g./kg. bromide) facilitated

immunization and the dose of vaccine that protected against challenge could be halved. The paper is presented in abstract form and full details are not given.—R.M.

Hahnefeld, H., Hahnefeld, E. & Korn, G. (1960). Ein Ausbruch von ansteckender Schweinelähmung (Teschener Krankheit) in Ost-Sachsen. I. Mitteilung: Neutralisierende Teschenvirus-Antikörper bei Schweinen in Seuchengemeinden und in einem seuchenfreien Gebiet. [An outbreak of Teschen disease in East Saxony. I. Neutralizing antibodies in pigs.] — Arch. exp. VetMed. 14, 968-983. 429

The outbreak occurred between July 1958 and September 1959 and 82 pigs on 30 farms became ill. The authors intend to publish epidemiological observations elsewhere. Neutralization tests were done with cultures of piglet kidney cells and the "Jena" strain of Teschen virus (8th passage in pig brain). Seventy-one sera were collected from pigs in three affected districts nine months after the outbreak commenced: 29 neutralized the virus in titres of 1:16 or above, compared with only 2 of 30 sera from pigs in uninfected districts. Incidence was compared in breeding, fattening and youngstock groups.—R.M.

Surdan, C. & Berbinschi, C. (1960). Cercetări histopatologice în boala de Teschen experimentală. [Histopathology of experimental Teschen disease.] — Probl. Epiz., Bucureşti No. 10 pp. 69-79. [In Roumanian. Summaries in French and Russian.] 430

A description of the clinical picture and lesions in the central nervous and digestive systems and in liver, spleen and kidneys of 12 piglets 12-30 kg. in weight, infected intracerebrally with 0.5 ml. of a 10% suspension of porcine encephalomyelitis virus in saline.

—E.G.

Goret, P., Fontaine, M., Brion, A., Pilet, C., Girard, M. & Legrand, P. (1960). Recherches expérimentales sur la prévention et le traitement de la pneumonie à virus du porc par le chlorhydrate de tétracycline. [Prevention and treatment of porcine virus pneumonia with tetracycline.] — Rec. Méd. vét. 136, 711-730. [Summaries in English and Spanish.] 431

Tetracycline hydrochloride in a daily dose of 10 or 15 mg. per kg. body wt. did not protect or cure pigs from virus pneumonia when given in the food for up to 3 weeks after infection, but permitted normal weight gains. A daily i/m dose of 15 mg./kg. in aq.

suspension for 6 days from the time of exposure prevented or limited the development of lung lesions, but the pigs were highly susceptible to subsequent infection.—M.G.G.

Swahn, O., Walzl, H. & Obel, A.-L. (1960). Die Bedeutung des schwedischen Schweingesundheitskontrollsystens für die Bekämpfung der enzootischen Pneumonie. [The Swedish pig health service in the control of enzootic pneumonia.] — Wien. tierärztl. Mschr. 47, 226-234. [Summaries in English, French and Italian.] 432

Most breeding herds of pigs in Sweden are controlled by the pig health service, which was started in 1943 for the purpose of eradicating endemic diseases [see also *V.B.* 30, 826]. Stamping-out is the method of choice for virus pneumonia, but in valuable herds healthy sows and their piglets are isolated. Certain areas have been declared practically free from virus pneumonia and atrophic rhinitis, and only healthy pigs are admitted.—M.G.G.

Matthias, D. & Becker, C. H. (1960). Über eine in der DDR gehäuft auftretende Gastroenteritis der Schweine. [A form of porcine gastroenteritis common in East Germany.] — Mh. VetMed. 15, 249-256. 433

The disease has been frequently encountered at the institute for veterinary pathology at the Humboldt University of Berlin since November 1959. The pathology was described. It closely resembled the transmissible gastro-enteritis described in West Germany and elsewhere.—R.M.

Pehl, K.-H. & Benndorf, E. (1960). Über die Isolierung und die Eigenschaften eines filterbaren Agens als Erreger einer seuchenhaft auftretenden Gastroenteritis der Schweine im norddeutschen Raum. [Isolation and properties of a filtrable agent causing epidemic gastro-enteritis among pigs in northern Germany.] — Arch. exp. VetMed. 14, 953-967. 434

Outbreaks occurred in the winter of 1959/60 in the Rostock area (East Germany). Two strains of virus were isolated and were passaged in pigs. Attempts to infect weaned or new-born mice and chick embryos failed. The agent had no cytopathic action on cultures of various porcine cells. The virus was similar to that of transmissible porcine gastro-enteritis isolated in other countries, but it was not yet shown to be identical.—R.M.

Lübke, A. (1960). Zur histologischen Diagnose der originären Schweinepocken, der durch andere Erreger der Pockengruppe (Vaccine-, Kuhpockenvirus) hervorgerufenen Hautveränderungen und eines unspezifischen Kontakt-Ekzemes beim Schwein. [Histological differentiation between swine pox, skin lesions caused by other pox viruses, and a non-specific contact eczema in pigs.] — Dtsch. tierärztl. Wschr. 67, 113-118. [Summary in English.] 435

Histological sections of skin from pigs with swine pox could be distinguished from the lesions caused by cow pox and vaccinia by the presence in epidermal cells of characteristic intranuclear pale areas, and ballooning of cells in the stratum spinosum and inclusions in the cytoplasm. The pox-like eruption (pockenartiger Ausschlag) of piglets was histologically quite different: it was characterized by acute dermatitis with partial destruction of the epidermis and an exudate composed of pus, keratin and cells; here and there were microscopic intradermal vesicles and abscesses. L. suggested that the name pox-like eruption should be abandoned in favour of non-specific contact eczema.—R.M.

Pagnini, U. & Papparella, V. (1960). Sul potere citopatogeno di un virus avianizzato del cimurro su coltura di tessuti embrionali di pollo. [Cytopathic activity of avianized distemper virus on chick embryo tissue culture.] — Acta med. vet., Napoli 6, 253-259. [Summaries in English, French, German and Spanish.] 436

Multiplication of an avianized strain of distemper virus was achieved on primary culture of chick embryo tissue. Starting from the 9th passage, at least one week after infection, there was some cytopathic effect which remained practically unaltered throughout 10 subsequent passages.—T.E.G.R.

I. Anan'ev, V. A., Narskii, S. V., Besprozvannyi, B. K., Nazaretyan, E. L. & Priss, I. S. (1960). [Experimental studies on canine virus hepatitis. II. Clinical findings and laboratory tests.] — Voprosy Virusologii 5, 468-473. [In Russian. Summary in English.] 437

II. Anan'ev, V. A., Besprozvannyi, B. K. & Narskii, S. V. (1960). [An unusual strain of canine virus hepatitis.] — Ibid. 473-478. [In Russian. Summary in English.] 438

I. The Karabash strain of virus was inoculated i/p into 26 puppies. Symptoms

and changes in cell content and chemical composition of blood were recorded.

II. The strain "Rex" was isolated from a dog aged 18 months, which died from chronic hepatitis after two months' illness, by means of intracerebral passage in mice. The virus caused typical infectious hepatitis in puppies.

—R.M.

Govaerts, A. (1960). **Infectious canine hepatitis and human hepatitis.** —Arch. ges. Virusforsch. **10**, 395-398.

439

Canine hepatitis virus survived freeze-drying and subsequent storage at room temp. for 8 months without appreciable loss of titre. It did not have cytopathic action on cultured HeLa, human kidney or human embryonic kidney cells, but it multiplied slowly in the first two cell strains. Of ten sera from human beings with hepatitis, only one neutralized the canine virus in a dilution of 1 : 80.—R.M.

Woodrooffe, G. M. & Moulder, J. W. (1960). **Penicillin-insensitive and non-neutralizable variants of feline pneumonitis virus.** —J. infect. Dis. **107**, 195-202. [Part of authors' introduction.]

440

When penicillin-resistant feline pneumonitis virus was passed in chick embryo yolk sac, first in the presence of chloramphenicol and then in the presence of penicillin, a new type of virus was obtained [V.B. **28**, 1079].

This paper describes the isolation of the same type of variant from both penicillin-resistant and parent feline pneumonitis virus under several other widely differing selective conditions. Despite their diverse origins, the new mutants were all very similar and were invariably insensitive to both penicillin and neutralizing antiserum.

Röhrer, H. & Hoffmann, G. (1960). Beitrag zur Vermehrungsweise des Ektromelievirus. [Electron microscope observations on proliferation of ectromelia virus in mouse kidney.] —Arch. exp. VetMed. **14**, 997-1011.

441

Various stages in the development of virus elementary bodies, apparently from components of degenerated liver cells, were described, with 10 photomicrographs.—R.M.

Mitroiu, P. & Vior, C. (1960). Cercetări cu privire la patogenitatea și valoarea imunizantă a virusului pestei aviare și a virusului pseudopestei aviare pentru hamsteri. [Pathogenicity and immunizing capacity of fowl plague and Newcastle disease viruses for

hamsters.] —Probl. Epiz., București No. 10 pp. 47-56. [In Roumanian. Summaries in French and Russian.]

442

Intracerebral injection of as little as  $10^{-10}$  ml. of virulent Newcastle disease virus killed hamsters within 4-16 days. Smaller doses appeared to be non-pathogenic. Intracerebral injection of attenuated virus in doses of  $10^{-1}$  to  $10^{-4}$  ml. produced clin. symptoms, but was not fatal. Intraperitoneal injection of Newcastle disease virus and fowl plague virus appeared to be harmless. Attenuated Newcastle disease virus strains injected intracerebrally in doses of  $10^{-2}$  ml. conferred immunity to challenge with 100 m.l.d. ( $10^{-7}$  ml.) of virulent virus.—E.G.

Depoux, R. & Chambron, J. (1960). Note préliminaire sur l'incidence de la pseudo-peste aviaire dans la République du Congo. [The incidence of Newcastle disease in the Congo.]

—Rev. Elev. **13**, 53-56. [Summaries in English and Spanish.]

443

Antibodies against Newcastle disease virus were demonstrated in 34% of 373 serum samples from fowls in 3 districts, and the virus was isolated from 5 moribund fowls in one flock. All the infected birds were in small flocks owned by Africans.—M.G.G.

Weidenmüller, H. (1960). Die Veränderungen des weissen Blutbildes beim Huhn nach der experimentellen Infektion mit dem Virus der atypischen Hühnerpest, nach der Schutzimpfung gegen Newcastle-Krankheit mit Adsorbat-Vakzine nach Traub und nach der Infektion mit *Salmonella pullorum*. [The white blood picture of fowls with Newcastle or pullorum disease, or immunized with adsorbed Newcastle disease vaccine.] —Berl. Münch. tierärztl. Wschr. **73**, 171-173. [Summary in English.]

444

Both infections were accompanied by eosinophilia and monocytosis. In addition there was lymphopenia in Newcastle disease and lymphocytosis in pullorum disease. There was no leucocytic reaction in immunized birds. It was suggested that lymphopenia could be used as a diagnostic criterion in Newcastle disease, particularly in the very early stages when the blood test was still negative.—R.M.

Reuss, U. & Hilbrich, P. (1960). Versuche zur Immunitätsübertragung durch den Eidotter und ihre Bedeutung für die vorbeugende Bekämpfung der atypischen Geflügelpest. [Transmission of immunity via the yolk and

prophylactic control of Newcastle disease.] —Mh. Tierheilk. 12, 210-214. 445

Chicks from hens given up to 3 i/m doses of adsorbed Newcastle disease vaccine had no useful resistance to the virus given in the drinking water.—M.G.G.

Woernle, H. & Brunner, A. (1960). Zur Epizootiologie der infektiösen Bronchitis der Hühner. [Epidemiology of infectious bronchitis in fowls.] —Tierärztl. Umsch. 15, 217-221. 446

In fowls sent for examination, bronchitis virus was isolated from 11 young birds and only 2 adult birds, whereas precipitating antibodies were demonstrated in 12 young birds and 15 adult birds. Investigations in 29 flocks revealed precipitating antibodies in over 20% of the chicks or the adult birds in 13 flocks.

—M.G.G.

Thamm, H. (1960). Ein Beitrag zum Stand der Ornithose und ihrer Bekämpfung in der DDR. [Control of psittacosis in the German Democratic Republic.] —Mh. VetMed. 15, 339-341. 447

Antibodies against psittacosis virus were demonstrated in 25-55% of wild pigeons and in 12 birds in 5 of 39 flocks of fowls and ducks. Proposals for the control of psittacosis in East Germany included declaring the disease notifiable, use of diagnostic techniques by veterinary investigation centres and large fowl slaughter-houses, and veterinary supervision of broiler farms and fowl slaughter-houses.

—M.G.G.

Kravets, I. K. (1960). [Infectious sinusitis in young ducks.] —Veterinariya, Moscow No. 9 pp. 45-47. [In Russian.] 448

An acute, highly contagious disease occurred in the Amur area and was first seen in April 1959. It affected only ducks aged between 3 and 60 days and killed 60-90% of them. 10-15% died suddenly without previous sign of illness. The disease spread throughout a flock within 10-15 days of the first case. It commenced with rhinitis (foul-smelling nasal discharge) and conjunctivitis. Subsequently the nasal, frontal and infraorbital sinuses became swollen and full of a hard exudate. The cause was not established. The condition was reproduced in 2 of 5 ducklings inoculated with bacteria-free filtrate of sinus exudate. Bacteria isolated from sinuses were *pasteurella*, *staphylococci*, *streptococci*, *pseudomonas* and others.—R.M.

Pollard, M. & Starr, T. J. (1960). Propagation of duck hepatitis virus in tissue cultures prepared with collagenase. —J. Bact. 80, 571-572. 449

The virus grew in chick-embryo cells dispersed by collagenase but not in cells dispersed by trypsin. [See also *V.B.* 30, 145.] —R.M.

Mornet, P., Goret, P., Gilbert, Y. & Goueffon, Y. (1960). Sur les relations croisées des caractères antigènes et immunogènes des virus de la maladie de Carré et de la peste bovine. État actuel des recherches. [Immunological relationship between the rinderpest and dog distemper viruses.] —Rev. Élev. 13, 5-25. [Summaries in English and Spanish.] 450

A review of experimental work.—M.G.G.

Bankowski, R. A., Izawa, H. & Hyde, J. (1960). Tissue culture methods as a diagnostic tool — with particular reference to Newcastle disease and vesicular exanthema viruses. — Proc. 63rd Meet. U.S. Livestock Sanit. Ass. San Francisco, 1959, pp. 377-388. 451

The possibilities of tissue culture techniques for diagnostic purposes are discussed and the 2 general types of tissue culture procedures are described. Experimental data showed that tissue culture is a highly sensitive system which can be used for primary isolation of some types of vesicular exanthema virus and that the virus can be readily typed or differentiated by serological or other tissue culture techniques. HeLa cell cultures are readily and easily propagated and highly susceptible to Newcastle disease virus. The possibility of using the more rapid and simple tissue culture methods for research and primary isolation of the virus from infected fowls is being investigated. Results indicate that the "GB" strain, which has a marked cytopathic effect on HeLa cells, can be readily isolated by this method. The infected tube of cells can be used for identification of the cytopathic agent with specific immune sera by the haemadsorption test. Further studies with various strains of Newcastle disease virus are in the progress. Titration of Newcastle disease and vesicular exanthema viruses is described. Neutralization and haemadsorption tests with these viruses were also investigated and results are discussed.—T.E.G.R.

Lenahan, M. F. & Wenner, H. A. (1960). Propagation of enteric and other viruses in

renal cells obtained from non-primate hosts.

— J. infect. Dis. 107, 203-212. [Authors' summary modified.]

452

A variable susceptibility of 8 kinds of renal cells obtained from domestic and laboratory animals was observed following infection with 42 stock viruses. Renal cells from hamsters, calves, pigs and lambs had similar but not identical cytopathic reactions, and were better for use in the diagnostic laboratory than renal cells from rabbits, dogs, cats and mice. Inapparent (occult) infection in cultures of several different non-primate renal cells was found for 7 viruses.

Köhler, H. (1960). Die Rolle der Leukozyten als Virusträger. [Role of leucocytes as carriers of virus.] — Zbl. Bakt. I. (Orig.) 180, 140-144.

453

The viruses of Newcastle disease and influenza were ingested by leucocytes; they did not multiply within the leucocytes, but remained infective for at least three days. Fowls inoculated with small doses of N.D. virus remained healthy although considerable amounts of virus were present in leucocytes for three days after infection. It was suggested that this phenomenon could be utilized for diagnostic purposes.—R.M.

Anon. (1960). Interferon: the prospects for an anti-viral agent in man. — Rep. med. Res. Coun., Lond. 1958-1959 pp. 64-67.

454

Preliminary experiments indicated that if interferon was to be effective against viruses it must be prepared from cells from the same species of animal as that to be treated. It has been prepared on a large scale from chick tissues. The Medical Research Council, National Research Development Corporation and three pharmaceutical firms are now

See also absts: 465 (differentiation of fascioliasis from equine infectious anaemia); 482 (avian myeloblastosis); 508 (report, FAO); 510 (report, Agricultural Research Council); 585 (report, Australia); 587 (report, Swaziland); 589 (report, Sierra Leone); 590 (report, Bahamas); 591 (report, U.S.A.); 595 (book, farm animals in health and disease); 597 (book, diseases of wild animals); 602 (book, poultry breeding).

collaborating in large-scale research into the development of interferon as an anti-viral agent.—R.M.

Maghami, G. (1960). Séro-agglutination rapide et macroscopique pour la recherche d'anticorps de la fièvre Q. chez les animaux. [Rapid serum agglutination test for antibodies against *Rickettsia burneti* in animals.] — Arch. Inst. Hessarek 12, 69-71.

455

*R. burneti* antigen to which methylene blue soln. had been added was used in agglutination tests for Q fever in animals. The reaction could be read after 20 sec.-3 min. on a slide, and after 5-15 min. in a capillary tube.—M.G.G.

Trunkát, J. (1960). Možnosti přenosu Q-horečky masem a masnými výrobky ze zvířat infikovaných *Coxiella burneti*. [Transmission of Q fever by meat and meat products.] — Veterinářství 10, 209-210. [In Czech.]

456

Four pigs and three sheep were experimentally infected with doses of 2.5 ml. of a 10% saline suspension of yolk sacs from chick embryos infected with *Rickettsia burneti*. After recovery these animals were killed, 9-19 days after infection. *R. burneti* was demonstrated in the blood of three of the four pigs and in all three sheep. In the remaining pig it was, however, isolated from the bone marrow. Infectivity of organs and muscles depended on the blood content. *R. burneti* was not recovered from pickled meat and meat products heated to 72°-75°C. for 25-90 min. Fresh meat from animals of a known Q fever focus, slaughtered during the febrile phase, should be declared unfit for human consumption, but meat from apparently healthy animals from such an area may be used for the preparation of products which are boiled before consumption.—E.G.

## IMMUNITY

Mueller, A. P., Wolfe, H. R. & Meyer, R. K. (1960). Precipitin production in chickens.

XXI. Antibody production in bursectomized chickens and in chickens injected with 19-nortestosterone on the fifth day of incubation. — J. Immunol. 85, 172-179. [Abst. from authors' summary.]

457

Injection of 0.63 mg. 19-nortestosterone into eggs prevents differentiation of the bursa

Fabricii. Chickens resulting from such treatment were unable to produce precipitins at 6 or 22 weeks of age. Antibody response of chicks surgically bursectomized at 1 and 2 weeks of age was much lower than that of the intact controls.

Bursectomy at 10 weeks of age had little or no effect on the response to antigen at 22 or 34 weeks of age.

Surgical bursectomy had no effect on body weight. Hormone injection of incubating eggs produced birds weighing less than the controls and in generally poor health. Mortality in the hormone treated birds was high.

Denhardt, D. T. (1960). A possible basis for immunological tolerance. — Nature, Lond. 186, 728-729. 458

D. postulated a mechanism by which cells were induced to secrete synthesized protein into the serum. The hypothetical substances responsible were named 'secretases' by analogy with bacterial permeases. Such a theory was necessary because simple diffusion could not

See also absts: 301 (staphylococcal mastitis vaccine); 307 (natural resistance to TB. in horses); 344 & 345 (brucellosis); 348 (fowl spirochaetosis); 350 (leptospirosis in rabbits and horses); 357 (simultaneous vaccination of sheep against anthrax, brucella and pox); 393 & 398-400 (F. & M. disease); 450 (relationship between lind pest and dog distemper viruses); 454 (interferon); 455 (rapid agglutination test for Rickettsia burneti); 461 (Hypoderma); 473 & 474 (lungworms).

#### PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Chaudhari, R. P. & Kumar, P. (1959). Semi-field trials with some new organic insecticides for the control of lice on livestock.—Indian J. vet. Sci. 29, 1-9. 460

DDT and 8 other chlorinated hydrocarbons were tried against *Linognathus vituli* of calves, *Haematopinus tuberculatus* of buffalo calves, and *L. stenopsis* and *Damalinia caprae* of goats. The residual effect against *H. tuberculatus* following lindane lasted 4 weeks and was ascribed to the known ovicidal action of BHC, as compared to only one week following DDT, which does not kill the eggs.

—R. N. MOHAN

Khan, M. A., Connell, R. & Darcel, C. le Q. (1960). Immunization and parenteral chemotherapy for the control of cattle grubs *Hypoderma lineatum* (De Vill.) and *H. bovis* (L.) in cattle.—Canad. J. comp. Med. 24, 177-180. 461

Since some disadvantages have been experienced in the use of organic phosphorus insecticides as feed additives, in bolus form or as sprays for the control of warbles in cattle, studies were directed in search of an injectable agent such as a homologous antigen that might stimulate host resistance.

Antigen prepared from first instar larvae or *H. lineatum* given intramuscularly proved valueless and somewhat toxic, but when combined with a similar antigen treated with tannic acid a definite reduction of *H. bovis* larvae was noted. This proved as effective as an injectable organic phosphate, dimethoate.

A similar reduction of *H. lineatum* larvae

account for the passage of large protein molecules through pores in the cell membrane.

—R.M.

Kent, L. H. & Slade, J. H. R. (1960). Immunochemically-active cross-linked polystyrene preparations. — Biochem. J. 77, 12-17. 459

The authors enlarged on their previous report [V.B. 29, 3495]. Anthrax antigen adsorbed on polystyrene and injected s/c retained its ability to stimulate antibody production and to immunize animals against challenge. [For other work on this method see V.B. 28, 3260.]—R.M.

was not obtained and reasons for this are discussed.

The efficacy of *H. lineatum* antigen in suppressing *H. bovis* larvae signifies that either common antigens may be involved or that a non-specific immunity is induced.

—R. V. L. WALKER.

Lazarevitch, M. & Zivkovich, V. (1960). Die Kolumbatscher Mücke—*Simulium columbaczense* Fabr. (Diptera, Simuliidae) und die Folgen ihrer Stiche. [The blackfly *Simulium columbaczense* and its bite.]—Z. Tropenmed. u. Parasit. 11, 206-212. [Summary in English.] 462

Losses in livestock due to blackfly were caused by blockage of the respiratory passages either by large numbers of inhaled flies or oedema of the mucous membranes, resulting in suffocation. No toxic substance was isolated from the insects.—E.G.

English, P. B. (1960). Notoedric mange in cats, with observations on treatment with malathion.—Aust. vet. J. 36, 85-88. 463

A commercial wettable powder of malathion was very effective in treating notoedric mange in cats which were immersed in an aqueous suspension containing 0.25 to 1.25%, usually 0.5%, of the miticide. Treatment was usually repeated after a week. In toxicity trials with the wettable powder or an emulsion, symptoms appeared in 1 of 4 cats immersed in an 8% suspension and in both of 2 cats immersed in a 4% emulsion. The

emulsion was irritant and had a more unpleasant odour than the suspension. It appears inadvisable to use malathion except under

See also absts: 509 (report, N. Ireland); 585 & 586 (reports, Australia); 597 (book, diseases of wild animals); 602 (book, poultry breeding).

### PARASITES IN RELATION TO DISEASE [HELMINTHS]

Kelly, W. R., Sleith, F. St. G. & Hatch, C. (1960). **Dicrocoelium dendriticum in a bovine animal in Ireland.**—Vet. Rec. 72, 696. 464

At P.M. examination of a 1½-year-old heifer, 5 adult *D. dendriticum* and a number of adult *Fasciola hepatica* were found in the contents of the small intestine. Twenty-eight adult *D. dendriticum* and numerous adult *F. hepatica* were found in the liver. The bile ducts were thickened although not calcified, and there was general cirrhosis of the liver. No *D. dendriticum* eggs were found in the faeces. This appears to be the first record of this trematode in Ireland.—B. M. WILSON.

Kralj, M., Srebočan, V., Maržan, B., Turner, V. & Wickerhauser, T. (1960). Akutna fascioloza konja s posebnim osvrtom na diferencijalnu dijagnozu zarazne anemije. [Acute fascioliasis in horses and its differentiation from equine infectious anaemia.]—Vet. Arhiv 30, 192-199. [In Croat. Summaries in English and French.] 465

Acute fascioliasis in nine horses 4-13 years old and in a foal of six months, was characterized by emaciation, staggering gait, petechial haemorrhages under the tongue, hydrothorax, ascites, peritonitis, enlarged spleen and, in some, enlarged kidneys. The number of r.b.c. was low, the sedimentation rate accelerated. There was leucocytosis, neutrophilia, aneosinophilia and, in some, lymphopenia and reduction in serum cholinesterase activity. A reliable method of differential diagnosis from equine infectious anaemia was by histological examination of liver biopsy material or by P.M. examination of liver and organs for the presence of flukes. Faecal examination was of limited value.

—E.G.

Enigk, K. & Düwel, D. (1960). Zur Bekämpfung von *Galba truncatula* (Limnaeidae) durch Natriumpentachlorphenolat. [Control of *Limnaea truncatula* with sodium pentachlorophenate.]—Z. Tropenmed. u. Parasit. 11, 134-151. [Summary in English.] 466

Experiments at the Hanover veterinary college showed that under various conditions sodium pentachlorophenate was considerably

veterinary supervision, because atropine may have to be used quickly if symptoms of toxicity appear.—H. McL. GORDON.

more toxic for molluscs, particularly *L. truncatula* and *Radix ovata*, than copper sulphate. It also killed miracidia of *F. hepatica* but not the metacercariae or eggs. It was toxic for fish.—R.M.

Žuković, M., Wickerhauser, T. & Benčević, K. (1960). Komparativna istraživanja djelovanja olovnog arsenata i bakrenog sulfata u liječenju trakavičavosti ovaca. [Comparison of the anthelmintic effect of lead arsenate and copper sulphate against tapeworms in sheep.]—Vet. Arhiv 30, 259-262. [In Croat. Summaries in English and French.] 467

In trials on over 300 lambs aged 2-3 months, the anthelmintic efficacy against *Moniezia* infestation of single doses of 1 g. lead arsenate in capsules was superior to that of 30-35 ml. of 1.25% copper sulphate soln. Although the lead arsenate was apparently well tolerated, further toxicity studies were considered necessary.—E.G.

Sen, A. B. & Hawking, F. (1960). Screening of cesticidal compounds on a tapeworm *Hymenolepis nana* in vitro.—Brit. J. Pharmacol. 15, 436-439. 468

Worms collected from mice were kept alive in a nutrient broth, with antibiotics added to inhibit bacteria and incubated at 37°C. Different dilutions of the substance under test were added to a series of flasks; the minimum concentration which killed all the worms after exposure for 24 hours was determined. The most active of the 32 drugs tested were oil of chenopodium, dichlorophen, extract of cashew nut, antimony potassium tartrate and BIQ 20 [eicosamethylenebis (isoquinolinium iodide)].

—R.M.

Nemeséri, L. & Szabó, J. (1960). Feststellung der Trichinellose von Hunden mit der Mikropräzipitationsprobe. [Microprecipitation test for trichinella in dogs.]—Acta vet. Acad. Sci. hung. 10, 247-251. [In German.] 469

Roth's microprecipitation test was positive for 4 dogs with experimental trichinosis and negative for 10 dogs found to be free from trichinella. Of 1,000 dogs, 17 were positive;

12 of these were killed, and mild infestation was demonstrated in 8. The incidence of trichinosis in dogs in different countries was reviewed.—M.G.G.

Marazza, V. (1960). Ricerche sulla possibilità di acclimatazione alle basse temperature della forma larvale di *Tr. spiralis* (Owen, 1835) nelle carni sottoposte a trattamenti termici disinfestanti. [Survival of *Trichinella* larvae in meat at low temperature.]—Vet. ital. 11, 512-531. [Summaries in English, French and German.] 470

From results of experiments on pieces of meat from a fox infested with *Trichinella spiralis* it is concluded that the temporary cold storage of meat does not render the larvae resistant to the subsequent lower temperature at which meat is usually stored to render it safe for human consumption.—T.E.G.R.

Wettimuny, S. G. De S. & Abeysena, F. A. (1960). Bephenium hydroxynaphthoate "Alcopar" (B. W. & Co.) as an anthelmintic for dogs.—Ceylon vet. J. 8, 45-52. 471

The drug was safe and effective against *Ancylostoma caninum* when given in a single dose of 2 g. Dogs having severe infestations were given a second dose the following day. It caused vomiting and salivation when given in the form of a suspension; this was avoided by giving it in gelatine capsules.—R.M.

Larsen, H. E. (1960). Verminos bronkitis hos kvaeget. [Vermous bronchitis in cattle.] — Nord. VetMed. 12, 373-404. [In Danish. Summaries in English and German.] 472

Between 1932 and 1958 the Royal Veterinary and Agricultural College in Copenhagen investigated 43 outbreaks of husk. Details are tabulated. Treatment with cyanacethydrazide (by mouth or s/c daily for 3 days) was tried on 45 cases and an aerosol of chenopodium oil (one exposure for 18 min.) was tried on 44. Treated animals were housed at the college and were examined clinically and for larvae in faeces at intervals; they were compared with animals in the herds they came from. L. could detect no significant difference between the treated cattle and 58 untreated cattle. This was partly due to spontaneous recovery of ten untreated animals and to the advanced nature of the disease in some treated animals. Gradual improvement occurred in a number of treated animals, but it was difficult to judge the relative merits of either form of treatment.—R.M.

Taylor, E. L. (1960). The place of vaccines in the control of parasitic bronchitis in cattle.—Vet. Rec. 72, 684-688. 473

The difficulty in theorizing about helminthic vaccines is mainly caused by the lack of experimental data. This is due to the large number of variable factors involved in epidemiology. Three main conclusions, drawn from the study of bacterial infections among mice, seem to be applicable to epidemics of husk among cattle:—(1) The host-parasite relationship is such that the parasite would never become extinct. (2) The mortality rate depends in the main on the rate of immigration of susceptibles into the herd. (3) The host resistance is the most important factor in determining the development of an epidemic, and natural immunization plays a main part in the termination of an outbreak.

The three types of epidemics observed by experimental epidemiologists also apply to worm epidemics in cattle, *i.e.*, (1) Those occurring when a virulent strain of bacteria gained access to a previously unexposed population; (2) those occurring in infected communities, when dosage was increased by some environmental agent; and (3) those occurring in infected communities, when population resistance was lowered. Type (2) is the commonest for helminthic disease among grazing animals.

Parallels can be drawn between the succession of events in experimental epidemics in communities of mice and observed occurrences of parasitic bronchitis in cattle. There is reason for hope that the use of husk vaccine may raise the resistance of calves drafted into a herd to approximately the resistance of naturally immunized animals. But it will never eliminate infection from a herd.

The resistance of cattle in an endemic area must be maintained by repeated contact with the parasite. Thus in many cases vaccination must be repeated to maintain the resistance of the animal to disease. There is still much to learn about the use of vaccines and 12 questions are posed, which it is hoped will be answered by field observations of veterinary practitioners.—B. M. WILSON.

Becht, H. (1960). Beitrag zur Serologie der Metastrongylus-infektion des Schweines. [Serology of metastrongylus infestation in pigs.]—Dtsch. tierärztl. Wschr. 67, 177-180. [Summary in English.] 474

Antibodies were demonstrated in the blood of pigs by the indirect haemagglutination

test described by Boyden [V.B. 21, 3620], at the earliest 15 days after experimental infestation with *Metastrengulus elongatus*. Antibodies were also demonstrable in guinea-pigs, and in piglets infested i/v or by mouth with third-stage larvae. Antigen was produced by formalin treatment of r.b.c. sensitized with supernatant fluid of vacuum-dried, ground and centrifuged lungworm material, suspended in buffered saline. Third stage larvae exposed to immune serum produced precipitates at the front end of the sheath or at the genital pore, in exsheathed larvae.—E.G.

Vassilev, I. (1960). [Goats as hosts of *Ascaris lumbricoides*.]—C.R. Acad. bulg. Sci. 13, 75-78. [In Bulgarian. Summary in English.]

475

Five kids were infected experimentally with ascaris ova. The worms reached sexual maturity, though later than in pigs. In seven adult goats, infected similarly, only a small number of larvae migrated and mature worms were not seen in the small intestine.—E.G.

Olsen, L. S. & Kelley, G. W., Jr. (1960). Some characteristics of the early phase of migration of larvae of *Ascaris suum*.—Proc. helm. Soc. Wash. 27, 115-118.

476

Doses of 10,000 and 100,000 pig ascaris eggs were given to mice, rats and eleven-day-old pigs which were killed and examined 72 hours after infection.

The 100,000 egg dose accelerated migration in mice only. In all three hosts the 10,000 egg dose produced larvae in the lungs which were smaller than those in the liver. In hosts where larvae occurred in the stomach, these larvae, with the exception of those in one mouse, were smaller than the larvae in the lungs. Possible explanations for the size differences are suggested. The 100,000 egg dose in mice caused a reduction in the size of the pooled larvae from liver, lungs and stomach. Measurements of larvae from all three organs in the three hosts are given.

—B. M. WILSON.

Münich, H. (1960). Histotopochimische Untersuchungen an Darm, Leber und Lunge der weissen Maus nach Invasion mit Larven des Spulwurms *Ascaris lumbricoides*. [Histochemical studies on intestines, liver and lungs of white mice after infection by larvae of *Ascaris lumbricoides*.]—Wiss. Z. Humboldt-Univ. 9, 389-403. [Summaries in English, French and Russian. English summary modified.]

477

Contrary to other helminth larvae, migration of ascarid larvae through the host organs was not carried out with the help of histolytic enzymes. In the focus of inflammation caused by the larvae in the liver the content of glycogen, fat, ribonucleic acid, and amino acids is greatly reduced while the content of glycoprotein increases with increasing proliferation of the connective tissue. In the parenchyma of the liver outside the focus of inflammation an increased content of ribonucleic acid is observed after the fourth day of the invasion in connexion with the beginning regeneration of the destroyed tissue. It was surprising that other substances showed no differences from normal. Consequently the liver function as a whole was not disturbed by the invasion.

Vassilev, I. (1960). [Ecology of *Toxocara canis* and *Toxascaris leonina*.]—C.R. Acad. bulg. Sci. 13, 203-206. [In Bulgarian. Summary in English.]

478

Details are given of experimental infection in fowls and turkeys with these nematodes and the possible role of poultry as reservoirs of the parasites is discussed.—E.G.

Buljević, S. M. (1960). Prilog poznavanju migracionog puta *Gnathostoma hispidum* u organizmu svinje. (Prethodno saopćenje.) [Route of migration of *Gnathostoma hispidum* in the pig. (Preliminary note.)]—Vet. Arhiv 30, 268-271. [In Croat. Summaries in English and French.]

479

In one area of Yugoslavia large numbers of pig stomach worms (*Gnathostoma hispidum*) 6-10 mm. long were present in the hepatic arteries. There was thickening of the arterial wall and inflammation of the intima. In the tissue of the arterial wall, immature forms were often present. Young worms were often seen in the liver parenchyma around arteries and in the subserous tissue of the stomach wall, in the vicinity of the short gastric branches of the splenic artery where they reached 7-12 mm. The parasite was never found in veins.—E.G.

Jubb, K. V. (1960). The lesions caused by *Filaroides milksi* in a dog.—Cornell Vet. 50, 319-325.

480

*F. milksi*, a species of *Filaroides* in the dog, was described by Whitlock in 1956 [V.B. 27, 1499] and the present communication describes the lesions caused by the parasite which are mainly localized in the lungs. Macroscopically the pleura was thickened and

leathery and the lungs were emphysematous, greyish-brown and rubbery. Greyish, firm areas, varying in size and shape, were seen on the cut surface of the lung; they appeared to have arisen by the coalescence of primary miliary foci.

Microscopically normal lung tissue was almost absent, being replaced by a diffuse granulomatous reaction and disorganized by mechanical damage by the parasites and by emphysema. Reaction to the worms was granulomatous and was mainly directed against the microfilariae. Progression of this reaction led to complete bronchiolar obliteration and to diffuse and irregular infiltration of the alveolar septa by large mononuclear cells and giant cells.

Larvae within granulomata were also found in the brain, liver, pancreas, ovary, gastric mucosa, intestinal mucosa and thyroid. They were not found in the uterus, bladder, adrenal or diaphragm but the extrapulmonary granulomata were so small as to have been easily missed in these organs. Spread of the microfilariae from the lungs was haemato-

genous and continuous as judged by the varying ages of the disseminated lesions.

—T. E. GIBSON.

Žeškov, B., Vukelić, E. & Marolt, J. (1960). Rentgensko istraživanje onhocerkoze grebena u konja. [X-ray study of onchocercosis of the withers in horses.]—Vet. Arhiv 30, 247-251. [In Croat. Summaries in English and German.]

481

Details were given of radiological evidence of onchocercosis of the withers in 4 of 470 clinically healthy horses aged from 3 months to 20 years. The nature of X-ray findings in soft tissues and bones was discussed.—E.G.

Bhatia, B. B. (1960). *Onchocerca armillata Railliet and Henry 1909—a study of the infection in Indian sheep with remarks on its bovine hosts.*—Indian vet. J. 37, 394-397. 482

Immature female worms were observed in the wall of the anterior and posterior aorta of sheep, as also in the aorta of buffaloes and one bullock. The histology of the lesions was described.—R. N. MOHAN.

See also absts: 509 (report, N. Ireland); 586 (report, Australia); 590 (report, Bahamas); 592 (book, helminth parasites of animals and man); 597 (book, diseases of wild animals); 602 (book, poultry breeding).

## SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Nobel, T. A. & Neumann, F. (1960). Survey of animal neoplasms in Israel: 1954-1959.—  
Refuah vet. 17, 39.

483

Two tables give information on the neoplasms encountered in the period 1954-58 at the Veterinary Institute, Rishon-le-Zion, from a total of 280 animals: 37 fowls (including 17 with leucosis), 30 dogs, 3 pigs, 58 sheep and goats (including 50 cases of pulmonary adenomatosis, "jaagsiekte"), 8 horses, and 144 cattle (including 42 cases of "cancer eye", and 75 of leucosis).—E. COTCHIN.

Vismara, E. (1960). Contributo alla conoscenza delle neoplasie polmonari maligne del cavallo. Su di un caso di carcinoma di origine alveolare. [Pulmonary carcinoma in a horse.]—Clin. vet., Milano 83, 33-38. [Summary in English.]

484

An account of a malignant epithelial neoplasm in the lung of a horse. The tumour, which according to the classification suggested by Monlux (1952) was of multifocal origin and consisted of undifferentiated large cells, was identified as alveolar carcinoma. It is

considered that it had its origin in the alveolar walls, with metastases in the bronchial lymph nodes.—T.E.G.R.

Nielsen, S. W. & Horava, A. (1960). Primary pulmonary tumors of the dog. A report of sixteen cases.—Amer. J. vet. Res. 21, 813-830.

485

A detailed and well-illustrated account is given of the lesions in the 16 dogs (0.17%) with primary pulmonary tumours encountered in a survey of 9,282 necropsies of dogs made in the Department of Veterinary Pathology, Columbus, Ohio, in the 31-year period 1928-59: all the 16 cases were encountered in the last 9 years of the period. The tumours were classified as bronchiolar adenocarcinomas in 12 dogs, bronchial carcinomas in 3, and bronchial adenoma in one. The bronchiolar adenocarcinoma was typically a solitary, peripherally-located, well-circumscribed nodule, growing expansively and rarely metastasizing. Histologically it showed a single row of uniform cuboidal or cylindrical epithelial cells in a papillary arrangement on

thin connective-tissue septa. Two dogs had primary squamous-cell carcinomas, originating in small secondary or tertiary bronchi. The third bronchial carcinoma was composed of tall cylindrical cells, with areas of small anaplastic cells comparable with the so-called oat-cell or small-cell carcinoma of the human lung.

The ages of the affected dogs ranged from 6 months to 20 years, averaging 10 years. There was no special breed or sex incidence, and no indication of significant difference in incidence between city and country dogs.

—E. COTCHIN.

Schebitz, H. & Weiss, E. (1960). Ein multiples ossales Plasmozytom beim Hund. [Multiple plasma-cell tumours of bones in a dog.] — Berl. Münch. tierärztl. Wschr. 73, 201-204. [Summary in English.] **486**

A male Airedale aged 9 years had been lame and reluctant to move for 18 months. X-ray of a humerus fracture revealed neoplastic changes and the dog was destroyed. Plasma-cell tumours were found in humerus, vertebrae and ribs, also in liver and spleen.

—R.M.

Freire de Faria, J. (1957). Tumores testiculares do cão. [Neoplasms of the testicle in dogs.] — Bol. Téc. Univ. Rural, Brazil No. 1 pp. 56-71. **487**

Of 130 neoplasms found in dogs in Brazil, ten were of the testicle. Three were seminomas, 3 were interstitial-cell tumours and 4 were Sertoli-cell adenomas.—R.M.

Jabara, A. G. (1959). Canine ovarian tumours following stilboestrol administration.—Aust. J. exp. Biol. med. Sci. 37, 549-565. **488**

Ovarian tumours developed in seven bitches subjected to continuous stilboestrol administration. The ovaries of the eighth bitch in the experiment were normal macroscopically; microscopically there was hyperplasia of the follicular cells. The tumours were bilateral, and in three cases there were metastatic lesions throughout the body. The gross and microscopic appearance of the tumours is described.—N. WICKHAM.

Morgan, J. F., Tolnai, S. & Townsend, G. F. (1960). Studies on the *in vitro* antitumour activity of fatty acids. II. Saturated dicarboxylic acids.—Canad. J. Biochem. Physiol. 38, 597-603. **489**

The *in vitro* antitumour activity of royal jelly, as reported in previous studies, was attributed to a specific fatty acid component.

Possible antitumour activity of other fatty acids was investigated since metabolism of fatty acids to some more active substance might be associated with a tumour inhibition process.

In studies with fatty acids of the saturated dicarboxylic series antitumour activity was found to increase progressively with increasing length of the fatty acid chain.

—R. V. L. WALKER.

Seils, H. (1960). Über einen Fall lymphatischer Leukose bei einem Fohlen. Gleichzeitig ein Beitrag zur Ätiologie tierischer Leukosen. [Lymphatic leucosis in a foal.] — Mh. VetMed. 15, 522-528. **490**

Lymphatic leucosis was diagnosed in a foal three months old. The disease was characterized by weakness, fever, inappetence, swollen mandibular lymph nodes and pallor of the gums and conjunctiva. Blood samples were taken five, six, ten and eleven days after onset of first symptoms and there was a progressive decrease in the number of red and white corpuscles and in haemoglobin content. The foal died on the 12th day after the onset. The liver weighed 9.5 kg., the spleen 0.9 kg. In all other horses on this farm, including the dam and the foal's half-brother, a six-year-old gelding, there was an increase in lymphocyte values lasting several weeks. The gelding was the only surviving offspring of this mare, the other three died at about the same age as that in the case described. The virus aetiology of the disease was discussed.—E.G.

Bendixen, H. J. (1960). Untersuchungen über die Rinderleukose in Dänemark. I. Vorkommen und Verbreitungsweise. II. Pathogenese und Enzootiologie der übertragbaren Rinderleukose. III. Die klinischen Erscheinungen der übertragbaren enzootisch auftretenden und der sporadisch vorkommenden Krankheitsformen. IV. Das derzeit angewandte Bekämpfungsverfahren. [Leucosis in cattle in Denmark. I. Incidence and distribution. II. Pathogenesis and endemic status. III. Clinical picture of transmissible epidemic and sporadic forms. IV. Control methods.] — Dtsch. tierärztl. Wschr. 67, 4-7; 57-63; 169-173 & 257-262. [Summaries in English.] **491**

I. Another version of this paper has been abstracted previously [V.B. 28, 501].

II. Two forms of bovine leucosis, a sub-clinical leucotic and a clinical neoplastic, were distinguished and the incidence in various age groups within leucotic herds was studied. The

theory is advanced that the disease is caused by a virus and transmitted from dam to offspring *via* colostrum or milk. After an incubation period of 2-3 years, these animals may develop the subclinical form, characterized by hyperlymphocytosis, possibly in association with hormonal changes during puberty and sexual maturity. In these animals the clinical form is rarely seen. This theory is, however, unconfirmed. Qualitative and quantitative study of lymphocytes as a means of diagnosis was discussed in detail.

III. Neoplastic enzootic lymphomatosis was described in 103 cattle but details were also given of two sporadic forms, pathologically and perhaps also aetiologically quite distinct, one, seen only in adult cattle, was characterized by hairless, urticaria-like skin lesions, particularly on neck, back and thighs, covered with crusts of epithelial cells and dried exudate, the other, affecting calves and young cattle up to the age of 18-20 months, was characterized by gross enlargement of lymph nodes, accompanied by digestive disturbances and emaciation. [See also *V.B.* 28, 3302, and 30, 499 & 2273.]

IV. The regulations for the control of leucosis in Denmark which came into force

in July 1959, are given in full. Suspected or recognized cases must be notified. If only one case is demonstrated, the animal is slaughtered, the herd placed under observation and blood tests are carried out one and two years later. If 2 or more animals in a herd are affected, these are slaughtered and the herd is placed under state supervision; movement of the animals from the farm is prohibited, except for slaughter, semen and blood plasma may not be taken for use in other herds, and the milk must be pasteurized.—E.G.

Beaudreau, G. S., Becker, C., Bonar, R. A., Wallbank, A. M., Beard, D. & Beard, J. W. (1960). *Virus of avian myeloblastosis. XIV. Neoplastic response in normal chicken bone marrow treated with the virus in tissue culture.*—*J. nat. Cancer Inst.* 24, 395-415. 492

Culture of bone marrow from healthy fowls 37-168 days old was infected with the virus of avian myeloblastosis. After 12-20 days there was multiplication of cells which had the characteristics of myeloblasts. The amount of virus in the nutrient fluid increased. The disease was produced in healthy fowls by infection with cells grown in culture.—E.G.

*See also absts: 509 (report, N. Ireland); 511 (leucosis).*

#### NUTRITIONAL AND METABOLIC DISORDERS

Jaksch, W. (1960). Fussballengeschwulst bei Hühnern als Folge eines Mangelfutters. [Bumblefoot in fowls as a result of nutritional deficiency.] — *Wien. tierärztl. Mschr.* 47, 388-396. [Summaries in English, French and Italian.] 493

Swelling of the balls of the feet and at times the tarsal joint, with skin and feather changes, slow growth and 10% mortality occurred in chicks 3-4 weeks old. These conditions were controlled by adding 5 kg. dried yeast to 100 kg. of food.—M.G.G.

Greuel, E. & Querner, H. (1960). Untersuchungen zur Encephalomalazie der Küken unter Berücksichtigung des Geschlechts der befallenen Tiere. [Encephalomalacia in chicks: sex incidence.] — *Arch. Geflügelk.* 24, 256-262. [Summary in English.] 494

Encephalomalacia developed in 74 of 500 chicks; 56 were males, and 18 were females, a ratio of 3:1. The difference was attributed to the higher growth rate and food requirement of male birds.—M.G.G.

Haenel, H., Gerriets, E., Müller-Beuthow, W. & Gassmann, B. (1960). Fütterungsversuche mit hohen Dosen von Tetracyclin (Achromycin) an Hühnerküken. [Trials with high concentrations of tetracycline in food for chicks.] — *Arch. Geflügelk.* 24, 217-237. [Summary in English.] 495

Growth, efficiency of food conversion, and resistance to coccidiosis were better in 300 chicks fed tetracycline at 500, 750 or 1,000 p.p.m. in the food until 8 weeks of age, than in 300 chicks given 0, 10, or 50 p.p.m., and were best in those given 1,000 p.p.m. There was no great influence on the intestinal microflora, except for a decrease in clostridia and a slight increase in *Proteus*. The thiamine content of the liver was unaffected.—M.G.G.

Booth, A. N., Robbins, D. J., Ribelin, W. E. & DeEds, F. (1960). Effect of raw soybean meal and amino acids on pancreatic hypertrophy. — *Proc. Soc. exp. Biol., N.Y.* 104, 681-683. [Authors' summary modified.] 496

Rats fed raw soya bean meal as sole

source of dietary protein had pancreatic hypertrophy, poor growth and lowered feed efficiency. Addition of 4 specific amino-acids to this diet corrected growth and feed efficiency but did not prevent pancreatic hypertrophy. Decreased growth rate and impaired protein efficiency caused by feeding raw soya bean meal may therefore be due to direct stimulation of the pancreas resulting in excessive loss of critical amino-acids contained in pancreatic enzymes excreted in faeces.

Noble, R. C. & Thomas, B. (1960). **Study of some mineral mixtures designed for dairy cows.** — *J. Sci. Fd Agric.* 11, 485-497. [Authors' abst. modified.] 497

Analyses have been made of the important major and trace elements in 13 mineral mixtures designed as supplements for milking cows. They were judged with regard to their probable efficacy in satisfying the cow's mineral requirements. No mixture was completely unsatisfactory although in all cases the sodium content was too low. It is suggested that the data available (by no means complete) concerning the mineral requirements of dairy cows are not used to the best advantage in the design of mineral supplements.

Mills, C. F. & Murray, G. (1960). **The preparation of a semi-synthetic diet low in copper for copper-deficiency studies with the rat.** — *J. Sci. Fd Agric.* 11, 547-552. [Authors' abst. modified.] 498

The diet contained between 0.3 and 0.4 µg. of Cu per g. When supplemented with copper, the diet promotes rapid growth and good reproductive performance. With slight modification the diet would provide a suitable basal ration for studies of deficiencies of iron, zinc and manganese.

Tesink, J. (1960). Onderzoek naar de relatie bodem-plant-dier in Zeeland. [Studies on the relation soil-plant-cattle in the province of Zeeland, with reference to copper and manganese.] — *Tijdschr. Diergeneesk.* 85, 1131-1158. [In Dutch. Summaries in English, French and German.] 499

Samples of hair, faeces and blood from cattle and of grass and soil from 61 farms in the province were analysed for Ca, P, Mg, Cu and Mn over two years. Clinical diagnosis of copper and manganese deficiencies was confirmed by the analyses. Examination of hair provided evidence of mineral status for a matter of months beforehand, whereas blood provided information on the state at the

moment of collection only. The beneficial effect of administration of mineral supplements or top-dressing of pastures on the mineral status of cattle was investigated. The supplements were followed by a considerable improvement in fertility (average of 79% pregnant after first insemination compared with 57% before treatment), but top-dressing was not. Imbalance of Ca and P in grass and hay was also detected on a number of farms. Manganese and copper deficiencies occurred on farms where the soil of pastures had a high pH and a low humus content. Conditioned copper deficiency occurred in cattle on soils of low pH and high humus content which appeared to contain sufficient Cu. One reason why mineral supplements were preferred to top-dressing was that after top-dressing of pastures the udder and teats were contaminated with Ca and Mn and these elements got into the milk, causing rancidness in butter and accelerating gas production in cheese made from the milk.—R.M.

Dahl, L. K. (1960). **Effects of chronic excess salt feeding. Elevation of plasma cholesterol in rats and dogs.** — *J. exp. Med.* 112, 635-500

Sixty-five rats were fed diets containing an average of 7% NaCl for up to 18 months; 12 beagles were fed diets containing 1, 2 or 6% NaCl for up to four years. Elevations in plasma cholesterol were frequent and in some cases quite extreme, but there was no direct relation between this increase and blood pressure, kidney disease, body weight or food consumption. Although it seemed feasible that increase in plasma cholesterol could cause atherosclerosis, there was no evidence of this in the animals.—R.M.

Gardiner, E. E., Rogler, J. C. & Parker, H. E. (1960). **Magnesium requirement of the chick.** — *Poult. Sci.* 39, 1111-1115. [Authors' summary modified.] 501

In two experiments weight data and mortality indicated that the chick's dietary magnesium requirement is approximately 250 p.p.m. No adverse effects were noted with dietary Mg levels as high as 4,058 p.p.m. Deficiency symptoms included poor growth, nervous tremors, gasping and convulsions. Deficiency symptoms and mortality occurred very quickly when day-old chicks were fed diets extremely deficient in magnesium.

A direct relationship was observed between the level of dietary Mg and the level

of plasma Mg. The plasma cholesterol levels of birds on magnesium deficient diets were significantly lower than the plasma cholesterol levels on diets adequate in magnesium.

Laschet, U., Hohlweg, W. & Weise, W. (1960). Tierexperimentelle Untersuchungen über die Wirkung von Vitamin A auf Fertilität und Foet. [Effect of high doses of vitamin A on fertility and foetal development in rats.]—Int. Z. Vitaminforsch. 30, 77-82. [Summaries in English and French.] 502

High doses of vitamin A reduced fertility in female rats by their effect on the uterine mucosa and so on implantation of the fertilized ovum. They had no visible effect on foetuses.—E.G.

Hjertquist, S.-O. (1960). Biophysical and histochemical studies on tooth germs from normal and rachitic dogs.—Acta path. microbiol. scand. 50, 163-176. [In English. Author's summary modified.] 503

Tooth germs from normal and rachitic pups were investigated by means of micro-radiography, interference microscopy, auto-radiography and various histological staining methods.

In rickets the predentinal zone is increased in width and there are areas of mineral salt globules and interglobular dentine. In the healing phase, dentine with a normal mineralization pattern is formed appositionally on the defective dentine.

Autoradiography following i/v inj. of sulphur-labelled sulphate suggested that the appositional growth of dentine may be reduced in rachitic tooth germs, and that in the healing phase it increases but sometimes proceeds irregularly.

Agresti, A. (1960). Primo impiego di un sulfamidico ipoglicemizzante — BZ 55 — nella

See also absts: 509 (report, N. Ireland); 585 & 586 (reports, Australia); 593 (book, vitamin B<sub>12</sub>); 602 (book, poultry breeding).

## DISEASES, GENERAL

Anon. (1959). United Nations. The Agriculture Division of FAO. A summary of its organization, development and accomplishments from 2 December 1946 to 31 December 1958. pp. 301. Rome: Food and Agriculture Organization of the United Nations. 508

The section on animal health (pp. 246-263) summarizes the activity of FAO during the twelve years under review, with reference to rinderpest, foot and mouth disease, bovine

terapia del diabete mellito del cane. [Carbutamide therapy of diabetes mellitus in a dog.]—Acta med. vet., Napoli 6, 39-49. [Summaries in English and French.] 504

In a dog with severe diabetes carbutamide ("BZ 55") reduced the sugar content of the blood and urine and caused some clinical improvement followed by relapse, coma and death. The drug had no adverse effects on the digestive system, kidneys, nerve tissues or skin. It did, however, exert a toxic action by aggravating the changes in the haemopoietic system, plasma proteins and liver.—T.E.G.R.

McCarthy, R. D. & Shaw, J. C. (1960). Metabolism of volatile fatty acids by the perfused liver of cows with ketosis.—J. Dairy Sci. 43, 1010-1012. 505

The authors claimed to have demonstrated decrease in the production of ketones by the liver of cows with ketosis. A perfusion method similar to that used on goats [Proc. Soc. exp. Biol., N.Y. 99, 560 (1958)] was employed. A high content of ketones in the blood during ketosis might arise from sources outside the liver.—R.M.

Anon. (1960). Weather and ketosis in dairy cattle.—Agric. Res., Wash. 9, No. 3. p. 12. 506

The ketone body content in the blood of cows increased after 2-3 days at extreme air temp. At 3°F. it was 4-6 times higher than the normal 0.002-0.006%, and at 100°F. it was about twice normal.—M.G.G.

Krebs, H. (1960). Walter Ernest Dixon Memorial lecture [Number 9]—Biochemical aspects of ketosis.—Proc. R. Soc. Med. 53, 71-80. 507

A discussion of recent advances in knowledge of ketosis in man and animals.—R.M.

contagious pleuropneumonia, the zoonoses, infertility and other subjects. There is a complete list of Agricultural Studies, Development Papers and the 521 Reports of Experts (pp. 42-95).—R.M.

Gracey, J. F. (1960). Survey of livestock diseases in Northern Ireland. pp. 192. Belfast: H.M. Stat. Off. 12s. 6d. 509

This important survey was made on a

random sample of 600 farms during 1954 and 1955. It is packed with data on disease incidence in cattle, sheep and pigs. For example, losses of calves up to 6 months of age amounted to 6.2% of total births, while illness of various origin (classified) affected 5% of the calf population in one year and 7.7% in the other year. During the two years 1.2% of the cows died on the farms: specific infective diseases accounted for 10% of deaths (including 2.2% lost through piroplasmosis and 5.6% from TB.). Metabolic disorders accounted for 19% of deaths. In addition 9.2% of the cow population was disposed of on account of disease (infertility accounting for one half of these disposals), compared with 7.5% disposed of on account of age, poor yield or surplus to requirements. Mastitis affected 5% of the cows in a year and was present on one fifth of farms: it also accounted for 16% of cows discarded because of disease. Losses among heifers and steers were about the same as in cows (1.7% of the population, but parasitic diseases were the principal cause of death (33% of deaths) followed by specific infective diseases (23%).

An abattoir survey revealed tuberculosis in 22.8% of slaughtered cows, 15.2% of calves, 13% of bulls and 5% of heifers and steers. TB. was the main cause of carcass condemnation. Liver fluke was found in 67% of cattle and about 172 tons of liver was condemned during a year. Cysticercosis was found in 0.5% of cattle slaughtered. About 70% of hides from cattle slaughtered during June were damaged by warble fly larvae.

On average 119 lambs were born to every 100 ewes; 3.8% of lambs were born dead and 11.2% of those born alive died during the first 48 hours of life. Pulpy kidney disease accounted for 16% of deaths. During the survey period 5.8% of ewes died, 21% of them from braxy, 25% from accidents and injuries, and 7.4% from internal parasites. One in six of the farmers did not treat their sheep with anthelmintics, and most of those that did treat the sheep did so only once a year. The commonest reasons for emergency slaughter were accidents and injuries (44.4%), but pregnancy toxæmia was also a common reason (20%). Abattoir statistics showed that 58% of adult sheep had liver flukes and that 19.5 tons of liver was condemned annually.

Piglet mortality before weaning was estimated as 19% of pigs born, or 15% of live births, and the bulk of the losses were accounted for by accidental crushing by the

sow (28.5%), stillbirth (27%) and weak or runt piglets (17%). Losses after weaning accounted for 1.2% of pigs born (1.5% of pigs weaned) and occurred mainly between 2 and 5 months of age. Bowel oedema was responsible for a third of post-weaning deaths, pneumonia for 13.6% and gastro-enteritis for 13%. Tuberculosis was found in 2.2% of slaughtered pigs and accounted for 18% of carcasses condemned. Common reasons for emergency slaughter were injuries, hernia, arthritis, uterine prolapse, bowel oedema and paralysis.—R.M.

Anon. (1960). Some aspects of Agricultural research No. 2. A reprint of the articles in the report of the Agricultural Research Council for the year 1958-59. pp. 77. London: H.M. Stat. Off. 3s. 6d. 510

Four articles review the work of the Agricultural Research Council on foot and mouth disease, blood types in cattle, metabolic diseases of ruminants, and quality in milk. Four other articles deal with research on plants and crops. This publication is intended for farmers and scientifically-minded members of the public.—R.M.

Bratanovic, U. (1960). On the pathology of acclimatization of Danish dairy cattle in Yugoslavia. — Medlemsbl. danske Dyrlaegeforen. 43, 488-494. [In English.] 511

Ketosis is common in Danish cattle during their first year in Yugoslavia, but the incidence decreases by over a half in the second year, and in the third year it is no higher than in cows born in Yugoslavia. Puerperal infections and endometritis are more common and more severe in herds where the incidence of ketosis is high. Streptococcal mastitis was found in 9% of Danish cattle, leucosis was suspected in 5%, and Johne's disease was diagnosed in a few animals, but there were no cases of brucellosis or TB. Scours is a problem in the calves of Danish cows imported in late pregnancy.—M.G.G.

Fankhauser, R. & Luginbühl, H. (1960). Chronisch-interstitielle Pneumonie mit Adenomatose bei Rindern im Kanton Uri. I. Teil. [Chronic interstitial pneumonia and adenomatosis in cattle in the Canton of Uri, Switzerland. I.]—Schweiz. Arch. Tierheilk. 102, 47-58. 512

Luginbühl, H. (1960). Chronisch-interstitielle Pneumonie mit Adenomatose bei Rindern im Kanton Uri. II. Teil. [Chronic interstitial pneumonia and adenomatosis in cattle in the

**Canton of Uri. II.]**—Ibid. 146-161. [Summaries in English, French and Italian. English summary modified.] 513

An apparently unknown respiratory disease of cattle, particularly in animals 2-3 years old, was studied for 4 years. It appears during the winter housing period and is rare in cattle at pasture, when previously affected animals may occasionally show it. Only a few animals in a herd become severely ill, but almost all develop coughing. The symptoms are intermittent fever and violent dry cough, dyspnoea and abnormal sounds in the lungs. There is no true recovery, as the dyspnoea and cough remain and relapses are frequent. Animals with secondary bacterial infection and interstitial emphysema have to be slaughtered. Treatment with different drugs was unsuccessful. P.M. lesions are found only in the lungs, which in uncomplicated cases are free from bacteria. The lesions were compared with those of other lung diseases in man and animals. Two cattle inoculated with bacteria-free extracts of affected lungs did not develop symptoms and had no lung lesions when slaughtered one and four months later.

Kralj, M., Petrović, D., Brudnjak, Z. & Miklaušić, B. (1960). Zarazno oboljenje prednjih zračnih prohoda goveda. (Zarazni rinotracheitis goveda?) I. Epizootiologija i klinička slika. [An infectious disease of the upper respiratory tract in cattle — infectious rhinotracheitis? I. Epizootiology and clinical picture.]—Vet. Arhiv 30, 155-161. [In Croatian. Summaries in English and French.] 514

An outbreak of infectious respiratory disease which affected 154 cattle aged 1-2 years and lasted on the average 7-15 days, was described. Clinically, there was nasal discharge, fever, cough and indigestion. The superficial epithelium of hyperaemic, roundish spots of various size which formed on muzzle and nostrils gradually became necrotic and crusts formed. There was lymphocytosis but not leucopenia. The disease was transmitted to healthy cattle either by contact or by intra-nasal application of infected nasal discharge. With the exception of four cows which were slaughtered all recovered spontaneously, some having been given symptomatic treatment for indigestion.—E.G.

Gabraschansky, P. (1960). Zur Frage des totalen Herzblocks anlässlich eines beobachteten Falles mit neurogener Pathogenese bei einer Kuh. [Total heart block in a cow.]—Mh. VetMed. 15, 269-272. 515

A neurogenous form of total heart block without histological changes in the heart was studied in a cow. Loss of consciousness could be provoked by pressure in the region of the laryngopharynx near the upper tracheal rings. The cause was a small piece of wire near the left vagus in the region of the laryngopharynx.

—M.G.G.

Kleinbok, Y. I., Petrov, V. M., Baiturina, O. S., Podlinov, I. S. & Aisen, E. A. (1960). [Incidence, aetiology and treatment of bronchopneumonia in lambs.]—Veterinariya, Moscow No. 8 pp. 51-55. [In Russian.] 516

On six large sheep farms in South-east Kazakhstan bronchopneumonia accounted for 54-64% of all deaths from non-infectious disease over a period of four years. Most losses occurred between June and November, with maximum loss in August. Radiography revealed that 10-13% of lambs aged 1-2 months had lung defects. The underlying cause of pneumonia was regarded as poor nutrition which facilitated invasion by saprophytic micro-organisms. Antibiotic therapy gave good results.—R.M.

Lukashev, I. I. & Petrenko, G. G. (1960). [Aetiology and pathogenesis of porcine atrophic rhinitis.]—Veterinariya, Moscow No. 9 pp. 36-37. [In Russian.] 517

Incidence of atrophic rhinitis appeared to be higher in pigs born during March and April than in pigs born during the rest of the year. Seasonal differences in nutrition of the sow that might account for this were discussed.

—R.M.

Englert, H. K. (1960). Bedeutung von Hypophyse und Nebennierenrinde bei Schweineerkrankungen. [Role of the pituitary gland and the adrenal cortex in pig diseases.]—Dtsch. tierärztl. Wschr. 67, 262-266. [Summary in English.] 518

The literature is surveyed and some details given of the results of electrophoretic investigation of the blood serum of animals which had died suddenly. Prophylactic measures were discussed. Diseases related to failure of the pituitary-adrenal cortex system were successfully treated with the appropriate hormones.—JOYCE E. HAMMANT.

McDiarmid, A. (1960). Diseases of free-living wild animals. pp. 91. Rome: Food and Agriculture Organization of the United Nations. Animal Health Branch Monograph No. 1. 519

This is a commentary based partly on the

author's own experiences in England and partly on world literature. It is not an exhaustive review of the literature and it suffers from being about six years out of date, although the editorial staff have inserted a little more recent information. Some statements that need bringing up to date are (1) that the only record of ovine contagious ecthyma in wild animals concerns bighorn sheep (it has also been reported in Swiss chamois); (2) that African horse sickness exists only on the African continent; and (3) that avian encephalomyelitis does not exist outside the U.S.A.—R.M.

Itikawa, O. (1960). Untersuchungen über die Atombombenschäden bei Pferden in Hiroshima. I. Klinisches Bild und pathologisch-anatomische Veränderungen. [Radiation injury in horses of Hiroshima. I. Clinical picture and pathology of lesion.] — Dtsch. tierärztl. Wschr. 67, 322-327. [Summary in English.]

520

The atomic bomb dropped on Hiroshima killed 120 and injured 12 horses in a military stables. Of about 600 privately-owned horses in the city 330 died or were missing and 30 were injured. Losses in cattle were also recorded but only 3 were admitted to the military animal hospital with radiation injuries: 35 others died from fire or collapse of buildings and 70 from starvation following death of their attendants.

There is a detailed clinical and pathological report on two horses which were 1.5 km. from the centre of the explosion; they were examined and then killed 50 days afterwards. Both had burns on the side of the body nearest the explosion. Leucocyte counts were 4,000 and 5,900/cu. mm. Among the P.M. findings were ulceration of the gastric mucosa, catarrhal gastro-enteritis and atrophy of lymph nodes.—R.M.

Spörri, H. (1960). Über die Untersuchung der Herzodynamik und ihre diagnostische Bedeutung. [Cardiodynamics in the diagnosis of heart diseases in animals.] — Wien. tierärztl. Mschr. 47, 251-268. [Summaries in English, French and Italian.]

521

S. discussed the diagnostic applications of the electrocardiogram, phonocardiogram, and sphygmogram. He gave examples of examinations performed on horses, cows and goats.

—R.M.

Gratzl, E. (1960). Tachykardien beim Hund, eine klinische und elektrokardiographische

Studie. [A clinical and electrocardiographic study of tachycardia in dogs.] — Wien. tierärztl. Mschr. 47, 281-312. [Summaries in English, French and Italian.]

522

Tachycardia (over 160 beats a minute) was encountered in 98 of 323 dogs with suspected circulatory disorders. The causes of tachycardia were classified and examples were given of various types. The commonest type (85 of 98 cases) was continuous sinus tachycardia; the prognosis was poor, since 66 of these cases had myocardial lesions. Electrocardiography was valuable for establishing the nature of the condition.—R.M.

Strawbridge, H. T. G. (1960). Chronic pulmonary emphysema (an experimental study). II. Spontaneous pulmonary emphysema in rabbits. III. Experimental pulmonary emphysema.—Amer. J. Path. 37, 309-331 & 391-411.

523

Three types of spontaneous chronic vesicular emphysematous lesions were found in the lungs of 38 out of 155 apparently healthy laboratory rabbits. There are five plates of photomicrographs.

Pulmonary emphysema was produced in rabbits by repeated i.v. inj. of an inert particulate dye, Caledon blue R.C. The dye probably acted by obstructing large numbers of pulmonary blood vessels, thereby causing ischaemia. Thus chronic emphysema may be ischaemic atrophy of lung tissue.—R.M.

Di Martino, M., Mastronardi, M. & Piergrossi, A. (1960). Mediastino e sindromi mediastiniche nel cane; aspetti patogenetici, clinici e diagnostici. (Contributo clinico-sperimentale). Nota V. Quadri radiologici delle affezioni mediastiniche. [The mediastinum and mediastinal syndromes in the dog. V. X-ray diagnosis.] — Acta med. vet., Napoli 6, 181-226. [Summary in English.]

524

Radiographs of the principal mediastinal diseases in the dog are described. Diseases are divided into two groups: (1) those affecting lymph nodes—neoplastic type (leucosis, Hodgkin's disease, lymphosarcoma and reticulosarcoma); inflammatory type (TB., retrosternal lymphadenitis in canine virus hepatitis, and blastomycosis). (2) those not affecting lymph nodes—undifferentiated sarcomas and other neoplasms, lesions of the thymus (hypertrophy or neoplasia), heart base tumours, parasitic tumours, emphysema of the mediastinum, mediastinitis and diaphragmatic hernia.—T.E.G.R.

## POISONS AND POISONING

Janiak, T. (1960). Działanie siarczku talu w świetle niektórych metod leczenia zatrucia talem. [Research on thallium poisoning and its treatment.] — Med. Wet., Warszawa 16, 336-338. [In Polish. Summaries in English and Russian.] 525

Thallium sulphide powder injected i/v and i/p into 10 dogs, changed *in vivo*, into a soluble compound and only one dog which received the lowest dose of 25 mg. per kg. body weight survived; the others which received between 30-50 mg./kg. died within 4-8 days. This appears to be contrary to the claim of other workers (Edelman & Lipiec, 1955; Moeschlin & Demiral, 1952) that hydrogen sulphide or thioacetamide act as neutralizing agents in thallium sulphate poisoning by precipitating it into insoluble thallium sulphide.—M. GITTER.

Radkevich, P. E., Mamchenko, B. I., Tkalich, A. I. & Mařboroda, V. S. (1960). [Accidental poisoning of cattle with mercaptophos and its prevention.] — Veterinariya, Moscow No. 7 pp. 65-66. [In Russian.] 526

Mercaptophos poisoning developed in 384 cattle grazing near cotton that had been treated with this organic phosphorus compound. Symptoms and treatment were described.

—M.G.G.

Peters, R. A., Hall, R. J., Ward, P. F. V. & Sheppard, N. (1960). The chemical nature of the toxic compounds containing fluorine in the seeds of *Dichapetalum toxicarium*.—Biochem. J. 77, 17-23. 527

Further studies on ratsbane showed that

*See also absts: 585 (report, Australia); 602 (book, poultry breeding).*

## PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

Chaudhury, R. R. & Dikshit, M. B. (1960). Milk-ejecting action of ergot.—Nature, Lond. 186, 722. 531

The milk-ejecting action of ergotamine and ergometrine injected i/p was demonstrated in rats. The authors suggested that it acted by causing contraction of the mammary myoepithelium.—R.M.

Flückiger, U. & Hofer, A. (1960). Behandlung infektiöser Erkrankungen mit neuen Sulfonamiden. [Veterinary applications of three new sulphonamides: sulphaphenazole, sulpha-

the toxic principle was a fluoro-octadecanoic acid [see also *V.B.* 29, 2229]. The plant appeared to be able to concentrate fluorine present in soil.—R.M.

Parmelee, G. W., Gilly, C. L. & Gillis, W. T. (1960). Key to symptoms of plant poisoning.—Mich. St. Univ. Vet. 20, 121-127. 528

The authors list 84 clinical syndromes or symptoms caused by poisonous plants occurring in the U.S.A.—R.M.

Andrade, S. O. & Holzhacker, E. L. (1959). Investigações sobre plantas tóxicas no estado de São Paulo. [Investigations on poisonous plants in Brazil.]—Arch. Inst. biol. S. Paulo 26, 55-87. [Summary in English.] 529

Thirty-seven plants were tested for toxicity on lab. animals and in some instances on poultry and cattle. Six found to be toxic were: *Elvira biflora* (saponin); *Euphorbia peplus*; *Indigofera endecaphylla*; *Guarea trichilioides* (the camboatá tree, fruits poisonous); *Jussiaea suffruticosa* var. *ligustrifolia*; *Phytolacca thyrsiflora*.—R.M.

Burgisser, H. (1960). Intoxication chez le chiot par un insecticide à base d'hexachlorocyclohexane. [Poisoning of week-old puppies by BHC applied to the bitch before whelping.] — Schweiz. Arch. Tierheilk. 102, 367-372. [In French. Summaries in English, German and Italian.] 530

Benzene hexachloride was demonstrated in the organs of 3 puppies that died at the age of 8-9 days. The bitch had been dusted regularly with BHC powder, and had probably excreted it in the milk.—M.G.G.

chloropyridazine and compound 6257.] — Schweiz. Arch. Tierheilk. 102, 268-275. [Summaries in English, French and Italian.] 532

Sulphaphenazole is also known as Ciba Compound 17,922 or Orisulf; sulphachloropyridazine as Ciba Compound 10,370. Both have been tried in human medicine. A combination of the two was more effective than established sulphonamides for intramammary or intravenous therapy of bovine mastitis (100 cases). There is no information about the composition of Compound 6257; it was stated

to give good results when injected intraperitoneally. All three compounds were indicated in diarrhoea, metritis, pneumonia in cows; diphtheria, diarrhoea and joint-ill in calves; pneumonia and joint-ill in horses; piglet influenza and piglet diarrhoea.—R.M.

Heidrich, H. J. & Mülling, M. (1960). Untersuchungen über die therapeutisch optimale Applikationsart und Dosierung von Sulmet bei Rindern, Kälbern und Schweinen durch Blutspiegelbestimmungen unter Berücksichtigung der Verträglichkeit. 1. Mitteilung: Untersuchungen an Rindern. [Studies on the best method of administration and dosage of sulphadimidine for cattle, calves and pigs. I.]—Berl. Münch. tierärztl. Wschr. 73, 205-209. 533

Heidrich, H. J. & Benthien, H.-A. (1960). Untersuchungen über die therapeutisch optimale Applikationsart und Dosierung von Sulmet bei Rindern, Kälbern und Schweinen durch Blutspiegelbestimmungen unter Berücksichtigung der Verträglichkeit. 2. Mitteilung: Untersuchungen an Kälbern. 3. Mitteilung: Untersuchungen an Schweinen. [Studies on the best method of administration and dosage of sulphadimidine for cattle, calves and pigs. II & III.]—Ibid. 229-231 & 241-244. [Summaries in English.] 534

To maintain therapeutic concentrations of sulphadimidine in the blood, the following dosages were recommended: for cattle, an initial intravenous dose of 0.1 g. per kg. body wt. followed on subsequent days by a daily oral dose of 0.08-0.1 g./kg.; for calves, an initial subcutaneous dose of 0.1 g./kg., followed by a daily oral dose of 0.1 g./kg. (treatment should be interrupted on the 4th day to prevent toxicity); and for pigs, an initial subcutaneous or intramuscular dose of 0.1 g./kg., followed by a daily oral dose of 0.075 g./kg.—M.G.G.

Douthwaite, A. H. & Trafford, J. A. P. (1960). A new synthetic penicillin. — Brit. med. J. Sept. 3rd, 687-690. 535

Knox, R. (1960). A new penicillin (BRL 1241) active against penicillin-resistant staphylococci.—Ibid. 690-693. 536

Stewart, G. T., Harrison, P. M. & Holt, R. J. (1960). Microbiological studies on sodium 6-(2,6-dimethoxybenzamido) penicillanate monohydrate (BRL 1241) in vitro and in patients.—Ibid. 694-699. 537

This new penicillin is 6(2,6-dimethoxybenzamido) penicillanate monohydrate and it is also known as "celbenin". Its principal use

is the treatment of staphylococcal infections, for it resists the action of staphylococcal penicillinase. Another paper by E. T. Knudsen & G. N. Rollinson on pages 700-703 describes absorption and excretion in human beings, and papers on pages 703-706 and 707-708 describe clinical trials. R. E. M. Thompson and others (page 708) showed that all of 1,118 strains of staphylococci isolated at the Middlesex Hospital were sensitive to the new compound, whereas only 18% were sensitive to crystalline penicillin G. [See also V.B. 30, 3784.]—R.M.

Fortushnyi, V. A., Gladkov, I. N., Prostyakov, A. P., Shmidov, P. N. & Ezhova, O. I. (1960). [Antibiotic aerosols for the treatment of pig diseases.]—Veterinariya, Moscow No. 9 pp. 56-58. [In Russian.] 538

Solutions of antibiotics mixed with 20% glycerin were delivered through a 0.3-0.4 mm. diam. nozzle at the rate of 180-200 ml./min. by means of a pressure of 4 atmospheres. Another apparatus delivered soln. at 8 or 9 ml./min. For treatment of respiratory diseases the dose was calculated as 25 ml. of 1% antibiotic soln. per cubic metre of room space: a special room of 50 cu. m. capacity was used to treat batches of 50 young pigs. The pigs were exposed to the spray for 30-40 min. twice daily for 8-10 days. Used this way, chlortetracycline was said to cure 95% of pigs with respiratory disease (defined as coughing, nasal discharge, increased rate of respiration). Efficacy of treatment was checked by measuring concentrations of antibiotic in blood, tissues and organs. Therapeutic conc. of penicillin was maintained for 10 hours.

—R.M.

Hare, J. H. (1960). Antibiotic potentiation. A review.—Canad. J. comp. Med. 24, 171-175. 539

Following the discovery that antibiotics used in feed would increase growth in chickens, research has been directed toward the search for techniques that would increase the antibiotic level in the blood stream following oral administration. This potentiation of antibiotics is of great importance since sustained high blood levels have proved of therapeutic value with many systemic infections of livestock and poultry.

This review deals with the most recent research developments in this field.

—R. V. L. WALKER.

Anon. (1960). **Antibiotic combinations.**—Brit. med. J., August 20th, 587-588. 540

A series of trials with combinations of various antibiotics failed to show any synergic bacteriostatic effect. Tests for synergic bactericidal action, however, revealed antagonism between penicillin and a tetracycline and between penicillin and chloramphenicol. This was attributed to interference by a bacteriostatic antibiotic with the bactericidal action of another. It was recommended that the action of antibiotic combinations be studied thoroughly before their introduction to clinical practice.—M.G.G.

Blažek, K. (1960). Beitrag zur Morphologie der medikamentösen D-Hypervitaminose bei Fleischfressern. [Pathology of administration of excessive amounts of vitamin D to dogs, leopards and a tiger.]—Arch. exp. VetMed. 14, 336-348. 541

Lesions in 12 dogs, 2 leopards and a tiger that died from vitamin D poisoning were

See also absts: 370 (antibiotics against PPLO in fowls); 377 (treatment of coccidiosis in goats); 378 & 379 (treatment of coccidiosis in fowls); 384-386 (treatment of bovine theileriasis and piroplasmosis); 460 (insecticides); 466-468, 471, 472 (anthelmintics); 504 (carbutamide in diabetes mellitus).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Bhatnagar, D. S. & Chaudhary, N. C. (1960). **Influence of climate on the physiological reactions in Murrah buffalo calves.**—Indian vet. J. 37, 404-409. [Authors' summary modified.] 543

Six males and six females were studied between April and March in India. Pulse rate, respiratory count and body temperature were recorded morning and evening and were averaged for each animal and each month of the year. Records of maximum and minimum air temperature and relative humidity were also kept.

Change in air temperature seemed to cause variation in body temperature and respiratory count and relative humidity appeared to affect the pulse rate. Respiratory counts were most sensitive to atmospheric changes.

Gili, G., Toscano, G. & Gaidano, R. (1960). Contributo allo studio della composizione minerale dei peli di Bos taurus, L. Ricerche sul contenuto di arsenico nei peli di gruppi etnici allevati in uguali ed in differenti "nicchie ecologiche". [Mineral contents of the hair in cattle: arsenic.]—Veterinaria, Milano 9, 216-220. [Summaries in English,

calcifications in the stomach, kidneys and lungs, also in some cases calcinosis of the vessels of the cerebral plexus, kidneys, lungs and in a few cases of the heart and liver. Calcification of the cornea, calcium deposits in the thyroid, and contracted kidney were observed.—M.G.G.

Weatherall, J. A. C. (1960). **Anaesthesia in new-born animals.**—Brit. J. Pharmacol. 15, 454-457. [Author's abst.] 542

Pentobarbitone was more toxic to new-born than to adult rabbits and rats, produced a longer loss of righting reflex in new-born animals but did not anaesthetize them effectively in less than toxic doses. Urethane did not anaesthetize new-born animals in doses which anaesthetized adults. Ether produced loss of righting reflex at lower concentrations for new-born than for adults, but the new-born animals became anaesthetized more slowly.

French, German, Spanish and Portuguese.] 544

A comparative analysis of the arsenic content of the hair of Brown Swiss and Friesian cattle, in identical and in different environments.—T.E.G.R.

Tyler, C. & Geake, F. H. (1960). **Studies on egg shells. XIII. Influence of individuality, breed, season and age on certain characteristics of egg shells.**—J. Sci. Fd Agric. 11, 535-547. [Authors' abst. modified.] 545

Samples of eggs covering three laying seasons from three birds of each of four breeds have been examined. This study included percentage of cracked eggs, shell thickness and porosity, membrane thickness, total insoluble and soluble shell-N. There were individual and breed differences but certain generalizations were possible. Shells were thinner in summer, but not all birds were equally influenced by the season. Membrane thickness was lowest in spring and also diminished with age. The winter months gave the lowest values for cracked eggs and cracking appeared to be associated with thinner shells and also with a higher total shell-N, but it was evident that these were not the only factors involved.

McLaren, A. & Michie, D. (1960). **Control of pre-natal growth in mammals.** — Nature, Lond. 187, 363-365. 546

This control appears to be one of haemodynamics, related to the flow of blood to the placenta. Since the resistance to flow is low in the placenta, the pressure at which the blood is supplied would be related to the number of placentas present and foetal growth is affected therefore by this and the size which the placenta is able to attain in early pregnancy. Studies on superpregnant mice confirmed this view.—JOYCE E. HAMMANT.

Davletova, L. V. (1960). **[Comparison of the growth of digestive organs in foetuses of different breeds of sheep.]** — Dokl. Akad. Nauk SSSR 134, 1497-1500. [In Russian.] 547

Foetuses between 44 and 119 days of age were examined. Development of rumen, abomasum and intestine appeared to be more rapid in Hissar than in Merino sheep.—R.M.

Mount, L. E. & Rowell, J. G. (1960). **Body-weight and age in relation to the metabolic rate of the young pig.** — Nature, Lond. 186, 1054-1055. 548

The investigation was carried out on 98 pigs during the first 5 weeks of life. Oxygen consumption was used as an index of metabolic rate, and studied on three groups living at (a) 30°C. for the 1st week, (b) 4°C. for the 1st week, and (c) 30°C. for the 2nd-5th weeks. The difference in  $O_2$  consumption was studied between animals of similar weight but differing age. It was concluded that changes in  $O_2$  consumption with age were minor; the largest increases occurred in relation to increases in body weight. It was suggested that thermogenesis was well established at birth.—JOYCE E. HAMMANT.

Mise, H. (1960). **A study on the measurement of the volume of the circulatory blood of the horse.** — Jap. J. vet. Res. 8, 74-104. [In English.] 549

A comparison of the dye and isotope methods of estimating circulating blood volume was made on 32 horses, using Evans dye T-1824 and  $P^{32}$ . Using T-1824 within a range of 0.202-0.289 mg./kg. body wt., estimates varied depending on the method of evaluation: blood volume/kg. body wt. by the method of (a) Lawson was 62.0 ml. (b) Gregersen was 72.2 ml. and (c) Gibson and Evans was 76.0 ml. By means of  $P^{32}$  labelled corpuscles, an estimate of 73.56 ml./kg. body wt. was obtained. Comparison of the two

methods showed greater approximation between the values obtained by  $P^{32}$  and the Gregersen's dye method. Haematocrit values were extremely variable.—JOYCE E. HAMMANT.

Chowdhury, A. K. & Banerjee, A. K. (1960). **Blood pressure in horse.** — Indian vet. J. 37, 341-348. 550

The dorsal interosseous artery was found more convenient than the middle coccygeal artery for determining blood pressure, and the Baumanometer cuff was suitably modified to fit the foreleg. In 115 apparently normal horses of different breeds and types, the systolic and diastolic pressures were 144-194 and 105-150, respectively.—R. N. MOHAN.

Baksai-Horváth, E. (1960). Beiträge zur Bestimmung und Bewertung des anorganischen P im Rinderserum. [Determination of inorganic phosphorus in serum of cattle.] — Acta vet. Acad. Sci. hung. 10, 295-301. [In German.] 551

The inorganic P content of blood serum from cattle was determined after storage of the blood in the ice-box for up to a week. The content was stable for up to 24 hours after bleeding, rose during the subsequent 24-48 hours by an average of 22.4%, then declined gradually to almost the original level after a week. The phenomenon was attributed to enzyme reactions and bacteria.—M.G.G.

Anon. (1960). **The plasma kinins.** — Rep. med. Res. Coun., Lond. 1958-1959 pp. 72-75. 552

This is a review of the work of the past 10 years. The plasma kinins resemble acetylcholine and allied substances, but the contraction of smooth muscle induced is slower and is not inhibited by the antagonists of this other group. Physiologically they appear to be responsible for vasodilatation accompanying salivation and sweating. No evidence is available for the function of kinin in the kidney although it is excreted regularly in urine. The chemical structure has yet to be fully elucidated.—JOYCE E. HAMMANT.

Gonzales Stagnaro, C. (1960). El electrocardiograma normal del caballo pura sangre de carrera. [Normal electrocardiogram of Thoroughbred horses.] — Vet. y Zootec., Lima 12, No. 32 pp. 13-15. 553

A hundred horses were examined.—R.M.

Waites, G. M. H. & Moule, G. R. (1960). **Blood pressure in the internal spermatic**

**artery of the ram.**—J. Reprod. Fertil. 1, 223-229. [Authors' summary.] 554

The pulsatile blood flow in the internal spermatic artery of the ram is changed by the arterial coils in the spermatic cord so that the testis receives a relatively pulseless blood flow at a lower mean pressure. The major pulse-pressure reduction occurs in the proximal one-third of the coiled length of the artery; in the distal two-thirds, the character of the coiling and structure of the artery change. These observations are discussed particularly in relation to the thermo-regulatory function previously suggested for the internal spermatic artery.

**Johari, M. P. (1960). Studies on the sexual physiology of water-buffaloes.**—Indian vet. J. 37, 354-364. 555

J. recorded some observations on farm buffaloes in Uttar Pradesh in northern India. Of 811 calves born in 1946-1955, 398 were male and 413 female. The average age at first calving was  $1,648 \pm 117$  days in a total of 1,520 calvings, 75% of which were from August to February, with peak in September and October; 64% of 462 intercalving periods in 136 buffaloes ranged from 11-16 months; and the average gestation period [number of gestations not stated] was 310.4 days.

—R. N. MOHAN.

**I. Johnson, H. D. & Ragsdale, A. C. (1960). The effect of rising environmental temperatures (35°-95° F.) on thyroid  $I^{131}$  release rate of Holstein, Brown Swiss and Jersey heifers.**—J. agric. Sci. 54, 421-426. 556

**II. Johnson, H. D. & Ragsdale, A. C. (1960). Environmental physiology and shelter engineering. With special reference to domestic animals. LIII. Temperature effects on thyroid  $I^{131}$  release rate of dairy calves.**—Res. Bull. Mo. agric. Exp. Sta. No. 709 pp. 32. 557

I. Three calves of each breed were reared in either a 50°F. or 80°F. environment. At the completion of growth, the animals were exposed to progressively rising temperatures 35°-95°F., and the uptake and release of  $I^{131}$  by the thyroid was measured regularly. As the temperature increased the rate of release of  $I^{131}$  from the thyroid decreased, but above 80°F. there was a sharp increase in this rate. The animals reared at 80°F. exhibited the higher thyroid release rates, the Jerseys always had the highest rates. Above 80°F. all animals showed signs of stress with decrease in thyroid activity; those reared at 80°F. were the least affected.

**II. Changes in the thyroid release of  $I^{131}$  during growth** was studied in Jersey, Holstein and Brown Swiss calves, maintained at either 50°F. or 80°F. for the first year of life. The 3 breeds differed in thyroid activity regardless of environmental temperature; and that of the Jerseys was roughly twice that of the others. All showed increasing activity with age. The activity per unit weight was higher at 80° than at 50° and a constant relationship with surface area was revealed.

The effects of rising temperature on thyroid activity have been reported elsewhere: [see preceding abst.]—JOYCE E. HAMMANT.

**Sörensen, P. H. & Horváth, Z. (1960). Pajzsmirigyműködés-vizsgálatok rádióaktív  $I^{131}$  segítségével sertésekben. A hideghatásra jelentkező pajzsmirigyműködés mértéke és tartóssága.** [Radio-iodine test for thyroid function in pigs. Changes following exposure to cold.]—Mag. állator. Lapja 15, 316-318. [In Hungarian. Summaries in English and Russian.] 558

The effect of low environmental temperature on the thyroxine production of the thyroid gland of pigs was studied, using radioactive iodine. The technique is described. Eleven pigs weighing 21.5-30.7 kg. were exposed to an environmental temperature of 3°C. for 14 days and the average amount of thyroxine produced by each pig was 2.36 mg. per 100 kg. body wt. daily contrasting with the average amount of 0.76 mg./100 kg. produced by each of 8 pigs weighing 22.6-32.7 kg. which were kept at 18°C. After the 14 day period the first group was also exposed to an environmental temp. of 18°C. but the average amount of thyroxine produced by them on the 12th day was still significantly higher (1.23 mg. per 100 kg.) than that of the control group (0.66 mg./100 kg.). It was concluded that unfavourable environmental temperature causes an undesirable increase of thyroid activity which persists for a certain period after the optimal temperature is restored.

—A. SEBESTÉNY.

**Sajonski, H. (1960). Zur makroskopischen und mikroskopischen Anatomie der Hypophyse und des Hypothalamus von Schaf (Ovis aries) und Ziege (Capra domestica).** [Anatomy and histology of pituitary gland and hypothalamus in sheep and goats.]—Wiss. Z. Humboldt-Univ. 9, 233-258 & 405-435. [Summaries in English, French and Russian.] 559

A detailed account based on examination of 20 sheep and 20 goats. There are 80 illustrations and 7 pages of references.—R.M.

Zach, B. (1960). Topographie und mikroskopisch-anatomischer Feinbau der Epiphysis cerebri von Hund und Katze. [Topography and histology of the pineal body in dogs and cats.] — Zbl. VetMed. 7, 273-303. [Summaries in English, French and Spanish.] 560

A detailed account with 17 illustrations

See also absts: 510 (report, Agricultural Research Council); 511 (acclimatization of dairy cattle); 599 (book, structure of the fowl); 602 (book, poultry breeding).

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Ascarelli, I., Budowski, P., Bornstein, S. & Bondi, A. (1960). Deposition of NN'-diphenyl-p-phenylenediamine (DPPD) in chicks and eggs.—J. Sci. Fd Agric. 11, 509-514. [Authors' abst. modified.] 561

In order to assess the danger to man involved in the addition of the anti-oxidant DPPD to poultry mashes, its content has been determined in eggs and in the organs of chickens and laying hens fed different levels of this compound. DPPD accumulated mainly in the liver and in body fat. The maximum DPPD content of eggs and organs seems to be reached after feeding for 2 weeks, while practically all stored DPPD disappeared in 2 weeks after the feeding of DPPD stopped.

The absolute amount of DPPD deposited in eggs and in the carcass of birds fed the usual amount (0.0125%) of anti-oxidant seems to be very small.

Röhrer, H. (1960). 50 Jahre Forschung auf dem Riems. [Fifty years of research on the Island of Riems, with bibliography.]—Arch. exp. VetMed. 14, 713-763. 562

This and three other articles in the same issue of the *Archiv* give a comprehensive account of the Friedrich Loeffler Institute, founded by Loeffler for the study of foot and mouth disease on 10th October 1910. There are many illustrations of Island and Institute. The bibliography lists 633 papers published since 1910.—R.M.

See also absts: 333 (salmonella in horse-meat); 334 & 335 (salmonella in slaughter pigs and cattle); 339 (salmonella in fowls); 456 (Q fever); 591 (report, U.S.A.).

## LIVESTOCK HYGIENE

Komarov, N. M., Torpakov, F. G. & Slavin, A. M. (1960). [Ventilation of piggeries with heating of the incoming air.]—Veterinariya, Moscow No. 7 pp. 75-78. [In Russian.] 564

derived from examination of the pineal body from 40 dogs and 26 cats of each sex and of varying age. The literature is discussed, with 117 references. Four types of pineal cell were distinguished by their nuclear structure. Small cysts often occurred near the surface of the pineal body in dogs. Apart from calcification of pial vessels in a dog aged two years, no calcium deposition was found. There was no clear relationship between age and pineal morphology.—R.M.

Anon. (1960). United Nations. Report of the FAO international meeting on veterinary education, 25-30 April 1960. pp. 119. Rome: Food and Agriculture Organization of the United Nations. [Meeting Report AN-1960/4.] 563

The meeting was held in London and attended by delegations and observers from 41 countries. Of the 27 working papers which were presented, most described the present system of veterinary education in the author's country and projects for the future. Others dealt with the training of veterinarians to meet regional requirements, public health and radiobiology in veterinary education, specialized training, an education scheme for veterinarians in less developed countries, and the training of lay staff. A paper consisting of 37 pages of tables gives the distribution of veterinarians and veterinary schools and the ratio of veterinarians to livestock population in different countries. Recommendations were made on the establishment of new veterinary schools, standards of education, facilities for research in veterinary colleges, lay staff, specialization, post-graduate courses, the acceptance of students from less developed countries, the remuneration and conditions of veterinarians, and the creation of an international Panel to study and give advice on veterinary education throughout the world.

—M.G.G.

During autumn and winter the air temp. in a piggery containing over 1,000 pigs was raised to about 13°C. by heating the ventilating air introduced by a fan. The air movement

around the pigs was 0.113 metres per second and, at a height of 1.2 metres, 0.382 m. per sec. Comparison with a control piggery with natural ventilation revealed that the moisture, ammonia and carbon dioxide content of the air was lowered, condensation was almost eliminated, and the respiration and pulse rates of the pigs were reduced.—M.G.G.

See also absts: 317 (TB. Infection of poultry farms); 595 (book, farm animals in health and disease); 602 (book, poultry breeding).

### REPRODUCTION AND REPRODUCTIVE DISORDERS

Jeganathan, P. (1960). **Survival of bovine spermatozoa in an extender with "Complan"** (Glaxo).—Ceylon vet. J. 8, 53-55. 566

When used as a diluent for bull semen stored at 5°C., "Complan" gave better results than egg yolk-citrate diluent. The product is sold as "a complete food" and it is a blend of dried skimmed milk, arachis oil, calcium caseinate, malto-dextrin, cane sugar, several vitamins and 9 minerals.—R.M.

Harper, M. J. K., Bennett, J. P., Boursnell, J. C. & Rowson, L. E. A. (1960). **An autoradiographic method for the study of egg transport in the rabbit Fallopian tube.**—J. Reprod. Fertil. 1, 249-267. [Part of authors' summary.] 567

A new technique is described in which 120- $\mu$  anionic resin spheres, impregnated with the radioactive gold isotope  $^{198}\text{Au}$ , are employed to simulate rabbit eggs. By their use, a study has been made of the pattern of egg transport in the Fallopian tube of the rabbit. The determination of the rates of tubal transport presented here will be a basis for further comparative studies upon the effect of certain hormonal treatments.

Rajakoski, E. (1960). **The ovarian follicular system in sexually mature heifers with special reference to seasonal, cyclical, and left-right variations.**—Acta endocr., Copenhagen Suppl. No. 52 pp. 68. [In English.] 568

36 Red and White Swedish heifers, 18-25 months old, were used. After clinical studies two were slaughtered to represent each day of the cycle and the ovaries were sectioned. Oogenesis is completed by the time of birth. Primordial follicles in the mature heifer are the earliest stages, with nuclei in pachytene of the first meiotic prophase. In Graafian follicles nuclei have reached the dictyate stage (a corona radiates from a chromatin-rich centre as observed by other workers in rabbits). Mitotic activity in the granulosa subsides after follicles reach a

Thorp, W. T. S. (1960). **The design of animal quarters.**—J. med. Educ. 35, 4-14. 565

T. discussed general principles of design and construction, with illustrations of buildings for laboratory animals at three American institutes.—R.M.

diameter of 5 mm. Atresia begins (in medium-sized follicles) with degeneration of the granulosa. Following ovulation some luteal cells are fully developed by the 5th-6th day and the corpus luteum reaches peak development from the 9th-12th day. Regression was not observed before the 17th day. A technique was developed for the accurate count of all follicles over 1 mm. diameter. Only follicles below 5 mm. varied numerically with season, most in winter and spring. Possibly two follicle growth waves occur during each cycle, between the 3rd-4th and again between 12th-14th days. The full-sized follicle of the first wave undergoes atresia from the 12th-17th days, only that from the second wave ovulating. The right ovary tends to be 50% heavier than the left and to produce about 75% more follicles over 5 mm. and the same proportion of ovulations.

—F. L. M. DAWSON.

Allen, D. M. & Lamming, G. E. (1960). **The induction of breeding activity in lactating ewes during anoestrus.**—J. Reprod. Fertil. 1, 213-222. [Authors' summary modified.] 569

Forty lactating ewes were slaughtered: (1) during normal anoestrus (control), (2) after a series of three i/m inj. of 50 mg. progesterone (in oil) at 3-day intervals, followed after 48 hours by s/c inj. of 750 i.u. PMS, (3) after breeding activity had been induced by artificially manipulating the diurnal light:dark ratio.

Untreated control ewes showed no evidence of recent ovulations but a degree of ovarian activity was present as measured by the number of medium- and large-sized ovarian follicles.

Injections of progesterone and PMS induced ovulation in 19 of 20 ewes and oestrus accompanied ovulation in 12. However, in ewes which mated there was a complete failure of fertilization.

Manipulation of the diurnal light:dark

ratio induced ovulation in all ten treated ewes and oestrus was observed in nine. Oestrus was preceded by 'silent heat'. The response to this form of treatment was slow but uniform. Of the ova recovered 41% were cleaving.

A semi-quantitative estimate of the potency of total gonadotrophin in the anterior pituitary gland indicated a significantly higher level of gonadotrophin in untreated control ewes than in ewes which ovulated, suggesting that both forms of treatment induced a release of gonadotrophin from the anterior pituitary gland.

Clegg, M. T. & Ganong, W. F. (1960). The effect of hypothalamic lesions on ovarian function in the ewe.—*Endocrinology* 67, 179-186. 570

Stereotaxic lesions were placed in various parts of the hypothalamus of 20 normal ewes. Lesions in the pituitary stalk and adjacent median eminence of 4 ewes were associated with the absence of ovarian activity, although the anterior pituitary and adrenals showed no atrophy. The follicle stimulating hormone content of the pituitary was slightly depressed. Destruction in the area above the anterior medium eminence of 3 ewes inhibited sexual behaviour without affecting the ovarian cycles. In 13 control animals where lesions were so placed as to avoid these areas, normal behaviour and cycles continued.

—JOYCE E. HAMMANT.

Horváth, I., Mészáros, I. & Kiszely, G. (1960). Szarvasmárha-endometrium hisztokémiai vizsgálata. II. Hiányos takarmányozás következtében sérült endometrium hisztológiai és hisztokémiai változása a nemiciklus különböző fázisaiban. [Histochemistry of the endometrium of the cow. II. Changes associated with under-feeding at different stages of the reproductive cycle.]—*Mag. állator. Lapja* 15, 292-295. [In Hungarian. Summaries in English and Russian.] 571

In a herd of 300 cows and heifers in which infertility was a problem (incidence of repeat breeders unusually high and oestrus in 48 animals associated with bleeding), study of the nutrition, and blood analyses, revealed that the supply of phosphorus and the blood P levels of the animals were deficient. After the diet had been adjusted to a higher P level the infertility problem disappeared.

Histological examination of 56 uterine biopsy samples from cows and heifers at

different stages of the oestrous cycle which (a) were infertile as a result of faulty nutrition or (b) bled during oestrus, revealed (briefly) the following features: (a) atrophic and chronic inflammatory changes, (b) abnormally intensive hyperaemia, oedema, destruction of blood vessels and consequent degeneration of the epithelial cells. The findings are reported in detail. Seven different staining methods were used for each sample.

—A. SEBESTENY.

Becze, J. & Pásztor, L. (1960). Tehenek és üszők tartási és takarmányozási okokból előállott meddőségének klinikai, hisztológiai és hisztokémiai vizsgálata. [Bovine sterility associated with faulty management and nutrition: histological and histochemical changes in the endometrium.]—*Mag. állator. Lapja* 15, 296-299. [In Hungarian. Summaries in English and Russian.] 572

It was observed in a herd of 1,000 cows and heifers that only 15.2% of the animals returned to oestrus 2 months after and 40% of the animals 4 months after calving. Analysis of the soil and home grown feeding stuffs showed abnormally high calcium and lower phosphorus; the animals in addition received extra calcium supply, while bran was included in their rations only in very small amounts. It was therefore assumed that infertility in the herd was due to Ca:P imbalance. Data are given on the age distribution of infertility and the nature and incidence of clinically detectable changes in the genital organs.

Uterine biopsy samples from 24 infertile cows were examined histologically with haematoxylin-eosin staining, and histologically (periodic acid-Schiff reaction and examination for alkaline phosphatase). Details of the histological findings in the various stages of the oestrous cycle are given and compared with those of the normal uterus. The changes may be summarized as focal lymphocytic and plasma cell infiltration, periglandular connective tissue hypertrophy and decrease of the content of alkaline phosphatase and periodic acid-Schiff positive materials (mucopolysaccharides).

The authors name the condition "endometritis interstitialis".—A. SEBESTÉNY.

Cohen, P. (1960). Invloed van vitamine D<sub>3</sub> op de geslachtsfuncties van het rund. [Influence of vitamin D<sub>3</sub> on reproductive performance in cows.]—*Tijdschr. Diergeneesk.* 85,

1163-1173. [In Dutch. Summaries in English, French and German.] 573

C. treated in Israel 73 cows that had not come on heat for some months with an i/v inj. of 5-10 million units of the vitamin. 52 subsequently came on heat, 17 of them 9 or 10 days after treatment. Of 39 that were followed up, 24 became pregnant after one insemination.—R.M.

Kurnosov, K. M. (1960). [False anastomoses of placental vessels during embryonal parasitism in relation to freemartins in sheep.]—Dokl. Akad. Nauk SSSR 134, 493-496. [In Russian.] 574

What appeared to be anastomoses between the placental vessels of neighbouring sheep foetuses were false in the majority of instances. True anastomoses, which could lead to the development of freemartins, were found in only 0.8-0.9% of 300 placentas examined by the author.—R.M.

Wheat, J. D. (1960). Harelip in Shorthorn cattle.—J. Hered. 51, 99-101. 575

Harelip in two Shorthorn bull calves is described. The mode of inheritance was not determined.—E.G.

Warwick, B. L., Davis, S. P., Berry, R. O. & Patterson, R. E. (1960). "Silky" a dominant mutation in sheep.—J. Hered. 51, 39-42. 576

A dominant mutation in Merino sheep called "silky" is described. In new-born lambs the wool appears smooth and wavy and skin folds are absent. Wool of adults lacks the characteristic "crimp". Mortality in mutants is high.—E.G.

*See also absts: 308 (genital TB. in cows); 509 (report, N. Ireland); 584 (report, Great Britain).*

### TECHNIQUE AND APPARATUS

Rappaport, C., Poole, J. P. & Rappaport, H. P. (1960). Studies on properties of surfaces required for growth of mammalian cells in synthetic medium. I. The HeLa cell.—Exp. Cell. Res. 20, 465-479. 580

Rappaport, C. (1960). Studies on properties of surfaces required for growth of mammalian cells in synthetic medium. II. The monkey kidney cell. III. The L cell, strain 929.—Ibid. 479-494 & 495-510. 581

Two properties of glass surfaces important for growth of cells in synthetic media were total negative charge and proton exchange capacity. Under certain conditions cells would grow on a soft glass but not on a hard heat-resistant glass. Certain properties of the glass surface were essential for maximum growth of cells in the absence of protein. Satisfactory conditions could be obtained by treating the glass with sodium carbonate. In a subsequent paper (pages 580-584 of the same journal) a modification of this method was described.—R.M.

Duthie, I. F. & McDonald, I. (1960). The analysis of sodium, potassium and calcium, in biological materials, by the 'EEL' flame photometer, with algebraic corrections for mutual interference effects.—Lab. Pract. 9, 705-709 & 732. 582

The authors provided regression equations relating the extent of interference to the

Fischer, H. (1960). Crooked tail, an inherited defect in swine.—Hemera Zoa 67, 33-37. [In English. Summaries in German and Indonesian.] 577

Crooked tail due to fusion of some of the coccygeal vertebrae was reported in 4 related pigs. The number of coccygeal vertebrae was reduced. No other abnormalities were seen.—M.G.G.

Göbel, F., Schumann, H. & Heerlein, R. (1960). Erbliche Zahn- und Kieferanomalien bei den Haustieren mit eigenen Untersuchungen über das Auftreten verschiedener Zahnanomalien in der Nachzucht des Hengstes G. [Heredity anomalies of teeth and jaws in domestic animals and incidence of dental anomalies in the progeny of a stallion.]—Tierärztl. Umsch. 15, 71-78 & 111-116. 578

The first part of this article is a review. The second part discusses anomalies and diseases of the teeth of varying type and degree in 74 of 76 progeny of a stallion.—M.G.G.

Zimmer, E. A. & Stähli, W. (1960). Erbbedingte Versteifung der Wirbelsäule in einer Familie Deutscher Boxer. [Heredity spinal rigidity in a family of Boxer dogs.]—Schweiz. Arch. Tierheilk. 102, 254-264. [Summaries in English, French and Italian.] 579

Spondylosis deformans occurred in a Boxer dog, also in its parents and a litter mate. The condition was similar to Bechterew's disease in human beings.—R.M.

concentration of the interfering elements. The effects of K on Na, Ca on Na, Ca + P on Na, Na on K and Na + K on Ca were taken into account. A proposed correction system is demonstrated.—R.M.

James, C. W. & Hoerlein, B. F. (1960). *Cerebral angiography in the dog*.—Vet. Med. 55, No. 12, pp. 45-56. 583

See also abst. 600 (book, applied microscopy and photomicrography).

## REPORTS

Great Britain. (1959). **Milk Marketing Board. Report of the Productive Division, 1958/59. No. 9.** pp. 129. Thames Ditton: The Board. 584

The ARTIFICIAL INSEMINATION service continues to expand. In 1958-59 there were 22 centres and 76 sub-centres and Telephone Points, 144,278 members, and the number of cows inseminated at Board centres was 1,499,765. The grand total of cows inseminated, including those at non-Board Centres was 1,847,462. The number of bulls used for natural mating continues to decline. Figures in England and Wales were 54,000 in 1958-59 compared with 77,000 in 1953-54 and 100,000 in 1948-49. Bulls licensed in 1958-59 numbered 16,000, a thousand less than a year before.

Between 1947-48 and 1957-58 the overall conception rate was 64.4% gradually increasing to 68.2%. In 1958-59 it was 69.7%.

**TRIAL OF TWINNING IN BEEF CATTLE.** Details are given of the experiment in progress. The cost of the hormone injections and of the veterinary examinations concerned in pregnancy diagnosis is being met by the M.M. Board. Treatment consists of a single s/c injection of freeze-dried P.M.S. on the 17th day following oestrus. After insemination two visits are paid to the injected cow, one at the ten day stage to determine ovulation rate and the second at 6 to 8 weeks to discover whether single or multiple pregnancy is under way. Data available at publication show that induction of a reasonable number of twin ovulations without embarrassment from larger egg numbers is possible. It is not certain, however, that hormone treatment will give rise to any spectacular increase of twin-calving rate.

In the cow there is often a blood-stained discharge following oestrus. It is a common belief among farmers that post-oestral bleeding does not take place if fertilization has

A series of radiographs was made starting  $\frac{1}{2}$ - $\frac{1}{2}$  sec. after i/v inj. of "Hypaque-M" contrast medium into the common carotid artery. Good pictures of cerebral vessels were obtained in 22 healthy dogs without adverse effects. The method was successfully used to diagnose a brain tumour (meningioma).

—R.M.

occurred. Most heifers and cows bleed after oestrus even when conception has occurred. A conception rate of 50.9% was obtained on 206 cows, which showed a blood discharge at the time of insemination.

**SEmen PIGMENTATION.** It was established that this is due to the presence of riboflavin. There is evidence that this characteristic is hereditary and that it behaves as a Mendelian dominant. In a survey 40 of 511 fertile bulls were found to produce semen with the characteristic yellow pigmentation. All bulls that have yellow semen when young do not necessarily continue to do so. The shortest gestation period was in an Ayrshire cow, 196 days, with an Aberdeen Angus calf, the longest, 318 days, for a Hereford calf out of a Friesian cow.

There is an article giving details of P.M. examination of the genital tracts of 159 non-pregnant sows.—J. A. GRIFFITHS.

Australia. (1960). **Northern Territory Administration. Animal industry branch. Fourteenth annual report 1959-1960. (Covering activities for the year ending 30/6/60.)** pp. 62. Alice Springs: Animal Industry Branch. 585

There is a fairly high incidence of TUBERCULOSIS in cattle in certain districts, and a high incidence in buffaloes and feral pigs, many of which are slaughtered for human food. Most strains recovered were of the bovine type; a few non-pathogenic chromogenic strains of mycobacteria were isolated.

Two cases of PASTEURELLOSIS were diagnosed in cattle in the field, but were not confirmed by laboratory examination.

Outbreaks of BOVINE CONTAGIOUS PLEUROPNEUMONIA were seen in travelling mobs. A predisposing cause of the worst outbreak was probably the unusually heavy rate of stocking of the cattle while awaiting vaccination. Vaccination has become more widely practised and there has been a marked reduction in the incidence of the disease in

cattle on properties. Much of the vaccinating was supervised by the Animal Industry Branch, but a good deal was carried out by the owners. More cattle were sent into South Australia and Victoria for fattening from the Central Australia protected area which is free from the disease. A comparative trial with freeze-dried avianized vaccine and the standard culture vaccine resulted in a number of severe tail reactions from the avianized vaccine, and there was a more prolonged post-inoculation complement fixation (c.f.) titre following avianized vaccine. A comparison of the c.f. test and the whole blood slide agglutination test showed many disadvantages in the latter. No reactors were found among 80 feral water buffaloes. Two tame buffaloes were artificially infected by tracheal intubation. Both had febrile reactions and rising c.f. titres but there were no clinical signs. In one a resolving lung lesion was found P.M. and the causal organism was recovered. In the other only a few fine adhesions were seen. No transmission occurred to a small herd of control buffaloes in the same paddock.

An outbreak of TICK FEVER occurred in cattle moved into a district where ticks were plentiful. Numerous cattle were inoculated with blood from "tick fever bleeders" before being exposed to heavy tick infestation.

*Siphona exigua* continued to cause severe loss of condition in certain districts, in cattle and horses.

Heavy infestations with *Boophilus microplus* occurred in the northern parts of the Territory. On the Barkly Tablelands the maximum survival time for larvae was 3½ months. Mortality of eggs was very great in this area and explains the low incidence of the parasite there.

OSTEOMALACIA and BOTULISM have a wide distribution. Vaccination against the latter has been carried out with considerable success.

Histopathological examination of tissues from cattle and sheep fed on gidyea (*Acacia georginae*), the cause of GEORGINA RIVER POISONING, confirmed the hypothesis that the disease is a syndrome of acute heart failure, with lesions in the myocardium resembling those seen in "Falling Disease", an acute hypocuprosis on copper deficient pastures in Western Australia. However, administration of copper did not prevent Georgina River disease. Other poison plants noted include *Erythrophloeum chlorostachys*, *Sorghum almum*, *Atalaya hemiglaucia*, *Cycas media*, *Calotropis procera*, *Portulacca* spp., *Swainsona*

*burkei* (rich in selenium), *Zygophyllum* spp., *Euphorbia eremophila*, *Swainsona* spp., *Melia azedarach*, *Potalostigma quadriloculare*.

Other diseases mentioned briefly include strangles, internal parasites in horses, tetanus, mastitis, swamp cancer and chronic respiratory disease in poultry.

Animal husbandry studies included control of aphosphorosis, hormones in fattening cattle, cobalt supplements, animal behaviour (extensive field trials), the buffalo industry (including the use of tranquillizers injected from a dart fired by a modified air-rifle, "Capchur" gun). The Wild Life Section studied the habits and food preferences of kangaroos.

There is the usual wealth of statistical data on stock numbers and movements, with comments on the development of road transport for cattle. The report is illustrated with a number of good photographs of activities in the Northern Territory, including an entertaining demonstration of the value of phosphorus in boosting production (as a prize exhibit during a procession in the Centenary Celebrations).—H. McL. GORDON.

Australia. (1960). South Australia. Twenty-first Annual Report of the Council of the Institute of Medical and Veterinary Science, July, 1958–June, 1959. pp. 100. Adelaide: W. L. Hawes. Govt. Printer. [Items of veterinary interest pp. 76-87.]

586

Numerous cases of abscesses in the heads of sheep appeared to be due to *Corynbacterium pyogenes*. A ram died after showing symptoms of jaundice and haematuria, suggestive of leptospirosis. No evidence of leptospirosis was demonstrated, but a pasteurella was isolated. Following complaints that lambs died from ENTEROTOXAEMIA in spite of vaccination, four commercial vaccines were examined and proved to have very variable activity in stimulating the production of antibodies.

In studies on OVINE BRUCELLOSIS an isolated observation suggested that venereal transmission may occur, especially early in the mating season when individual ewes may be served by several rams. Evidence from the "epidemiology flock" in which serologically positive and negative ewes are mated with clean and infected rams, confirmed the very slow spread of the disease. The reason for the apparent rapid spread which occurs in young unmated rams will be sought in further experiments. In experiments on eradication, rams were tested (c.f. test) before and after

mating and reactors were slaughtered. The disease was eradicated rapidly from five of eight properties. Reasons for failures on the other three are discussed.

Three fatal cases of BLACK DISEASE occurred in cattle imported from another State.

An outbreak of TRICHOMONIASIS, with deaths and lesions in the upper parts of the alimentary tract, occurred in chickens, beginning at a week old and ceasing after a month.

Observations on a flock in which all sheep were infested with *Psorergates ovis* suggested that infestations are self-limiting; although the sheep were not treated itching and rubbing ceased, and it became difficult to detect mites in skin scrapings, and no sheep was found consistently positive.

An acute outbreak of HELMINTHOSIS in young cattle due to *Ostertagia ostertagi* and *Cooperia onchophora* responded dramatically to treatment with "Neguvon" (Dipterex), after failing to respond to phenothiazine, piperazine, sulphonamides, antibiotics or general care and better nutrition. The dose used, 100 mg./kg., produced toxic effects in some animals, but there were no fatal cases. Atropine provided rapid recovery from toxic effects.

Studies on nematode parasites of sheep showed that the seasonal changes in worm burdens (*Trichostrongylus*, *Ostertagia*, *Nematodirus*, *Strongyloides*, *Chabertia* and *Oesophagostomum venulosum*) followed similar patterns in late lambs (born in June) and early lambs (born in April/May), rising to peaks in February and July. In a region of higher rainfall *Haemonchus contortus* appeared and remained at fairly constant levels (egg counts from 1,000 to 2,000 eggs per g.) throughout. Sheep drenched monthly with phenothiazine (500 to 700 mg./kg.) were 11% heavier at the end of the trial when they were 13 months old, "possibly due to control of the *Haemonchus* infection". In a second trial the following year the differences between treated and control sheep were much less.

*Protostrongylus rufescens*, not previously reported in Australia, was found in sheep from the Millicent district. Preliminary trials with "Dictycide" (cyanacethydrazide) indicated that it was beneficial against *Dictyocaulus* in sheep in the field.

After showing that repeated injections of hyaluronidase reproduced the clinical symptoms of VITAMIN E DEFICIENCY in chickens fed a diet not supplemented with vitamin E,

the serum mucoprotein levels in normal and deficient chickens were examined. Although the chickens injected with hyaluronidase showed a greater rise in serum mucoprotein than the controls individual variation obscured the results (possibly because the chickens had become anaemic from the repeated bleedings).

In the northern part of the State deaths occurred in cattle from a disease resembling St. George Disease, as recorded in Queensland. The cattle were on a very low level of nutrition and responded rapidly to a protein-rich supplement.

A toxic syndrome was seen in sheep grazing a pasture containing much Perennial Rye Grass (*Lolium perenne*), and was reproduced by feeding in pens. Symptoms appeared within five days of access to the grass and included convulsions and tetanic spasms. Blood sugar increased and blood magnesium decreased. Although administration of magnesium raised the Mg level in the serum, symptoms were not alleviated.

A few cases of CYSTICERCOSIS have been diagnosed in material from cattle killed at the abattoirs.

Other items of veterinary interest include a note on malignant tumours submitted, assessment of the immunizing value of an antigen against helminth parasites, fungal infections in domestic animals, bacteriological examination of frozen semen from bulls, and vitamin E estimations. A report on laboratory animal facilities and holdings in Australia was made for UNESCO. The history of the Institute, now 21 years old, is briefly outlined.

—H. McL. GORDON.

Swaziland. (1960). **Department of Veterinary Services annual report for the year 1954.** [van Heerden, C. J.] pp. 18+xxi Appendices. 587

Swaziland is subject to most of the tropical diseases which occur in Africa. Foot and mouth disease and rinderpest did not occur. Other scheduled diseases, such as East Coast fever, anthrax, etc. were under control.

The export of cattle is still limited to two markets, Johannesburg and Durban.

The general improvement in the EAST COAST FEVER position—referred to in the three previous reports—has continued except for one isolated case.

RABIES in territories adjacent to Swaziland has caused the Department to give serious consideration to protective measures. Nine cases occurred in dogs and one suspicious but

unconfirmed case in a cat. Great difficulties were experienced in obtaining a supply of vaccine, but some Flury vaccine was received and vaccination carried out. Only dogs over six months were vaccinated and all puppies under that age were for a time destroyed.

ANTHRAX is controlled by compulsory vaccination; 88,000 doses were used.

No systematic search was made for TUBERCULOSIS but there was no evidence of this disease except in an imported Jersey bull. HEARTWATER took heavy toll.

No contagious diseases occurred in pigs, but in poultry, FOWL POX and FOWL TYPHOID were the most common. Up till 1954 internal parasites had not caused much trouble. No less than 14,413 smears were examined during the year. The report ends with 21 statistical tables added as appendices.

—D. S. RABAGLIATI.

Basutoland. (1960). *Annual Report of the Department of Agriculture, 1959.* pp. 98. Morija, Basutoland: Morija Printing Works. [Items of veterinary interest: pp. 72-82.] 588

From a livestock aspect the year has been poor; early and untimely snow in the mountains at the end of April and beginning of May caught the stock owners unprepared and a large number of stock was lost. After more falls, all of which exacted their tolls, a yet more unseasonable fall in October when the stock were at their weakest, caused more losses.

To improve the sheep stock, 323 Merino rams were bought in the Union of S. Africa; the best ever introduced. They sold very readily at subsidized rates to Basuto stockmen. This brings such importations up to 15,530 since 1935.

For the improvement of horses the Agnes Mary Young Memorial stud now consists of some 70 mares, fillies and colts while some 25 stallions are standing at stud in Basutoland.

No major outbreak of contagious disease occurred except isolated outbreaks of LUMPY SKIN DISEASE and BLACKLEG. Although no cases of ANTHRAX occurred, 35,000 doses of anthrax vaccine were used, almost exclusively for the inoculation of cattle imported from, or exported to, S. Africa.

Despite no case of RABIES occurring, repeated outbreaks in the adjacent Orange Free State caused restrictions to be imposed on dogs originating from certain districts.

FOWL TYPHOID appears to be the most

serious disease of poultry. The Veterinary Division has been at about two-thirds of its establishment.—D. S. RABAGLIATI.

Sierra Leone. (1960). *Report of the Veterinary Department for the year 1959.* [Birkett, J. D.] pp. 10. Freetown: Govt. Printing Dept. 2s. 0d. 589

No case of RINDERPEST has occurred during the year under review, but the position remains uneasy as large herds of susceptible cattle exist across the country's frontiers, and thousands of trade cattle enter Sierra Leone each year for slaughter. The only sound policy is to continue active immunization but this is becoming more difficult as cattle owners have become indifferent and have lost all fear of the disease.

In Koenodugo district a recrudescence of PLEUROPNEUMONIA occurred and some 50,000 cattle were inoculated with considerable success.

TRYPANOSOMIASIS in pigs on Government farms gave much less trouble than formerly. Antrycide suramin complex was used successfully.

Thousands of poultry must perish from NEWCASTLE DISEASE, but owners are becoming more aware of the benefits of the very efficient vaccine which is now available and 58,256 birds were immunized during 1959.

No positive case of ANTHRAX was noted in animals but some cases occurred in human beings.

In the south eastern Province a veterinary officer saw what may have been the first recorded case of GLANDERS in Sierra Leone. The horse reacted to the mallein test but it was not possible to confirm the disease from material submitted to the Laboratory.

—D. S. RABAGLIATI.

Bahamas. (1960). *Annual report of the Agricultural and Marine Products Board for the year ending 31st December, 1959.* pp. 28. Nassau: The Board. [Items of veterinary interest pp. 16-21.] 590

With the addition of certain equipment the Laboratory was enabled to conduct diagnostic work. Efforts were made to identify the major problems of animal health.

Tick eradication was commenced on two farms as was a vaccination scheme to protect pigs against SWINE FEVER. For this, 157 pigs were treated.

The yearly tuberculin tests were carried out on the milk herds in the New Province.

Only one animal reacted but the disease was not confirmed P.M.

Losses from ANAPLASMOSIS in the affected herds were much less than in previous years. Tetracycline was used successfully.

Several new poultry farms were established, but a high incidence of duodenal COCCIDIOSIS was noted in some flocks.

The routine worming of sheep and goats was encouraged. The nodular worm (*Oesophagostomum columbianum*) caused considerable losses from debility.

No outbreaks of notifiable disease occurred during the year, including no case of swine fever.—D. S. RABAGLIATI.

U.S.A. (1960). **New York State Department of Health. Annual Report of the Division of Laboratories and Research for 1959.** [Tompkins, V. N.] pp. 135. Albany: N.Y. St. Dep. Hlth. 591

The creation of the Laboratories for Veterinary Science and for Meat Hygiene in 1959 consolidated all veterinary activities

within the Department, into a single unit at the Division of Laboratories and Research.

The laboratories will conduct epidemiological investigations and studies of the diseases of animals transmissible to man, assist local health officers, in the control of zoonoses, provide safer meat and meat products and furnish diagnostic service for zoonoses, especially rabies.

A report is given on the RABIES virus from the salivary gland of a cat which died following vaccination with low egg passage modified live virus antirabies vaccine.

Pooled milk samples representing 243 herds of dairy cattle from 17 counties were tested with Q FEVER antigen of yolk sac origin. Of these, 32.9% gave positive reactions.

Animal sera examined for LEPTOSPIROSIS included 75 dogs, 2 sheep, 4 pigs, 85 deer or fawns, 17 racoons, 19 hamsters and 34 monkeys. Urine from 11 calves and 10 deer was also examined for antibodies.

—D. S. RABAGLIATI.

#### BOOK REVIEWS

Kotlan, A. (1960). **Helminthologie. Die Helminthosen der Haus- und Nutztiere unter Berücksichtigung der Helminthosen des Menschen.** [Helminths of animals and man.] pp. 631. Budapest: Hungarian Academy of Science. 592

This is a text on the helminthic diseases of domestic animals and, in lesser detail, of man. The arrangement of the book is based on the nomenclature of helminthoses in use in eastern Europe and the material on each disease or group of diseases is divided into sections of systematics and morphology, pathology, symptoms, diagnosis, therapy and prophylaxis. This rather rigid arrangement, while it makes the book only very slightly easier to use as a work of reference, does not help the author to give a complete and coherent picture of disease problems or to relate these to agricultural or social conditions. The book aims to cover the literature up to 1958 but a number of significant developments are not mentioned in the text and are omitted from the bibliography. This comprises 500 items drawn from both Western and Eastern sources. The book has many merits and does not fall very far short of achieving its ambitious objects. It is attractively produced,

adequately illustrated and well provided with keys for the identification of most species.

—J. F. MICHEL.

Smith, E. L. (1960). **Vitamin B<sub>12</sub>.** pp. xii + 196. London: Methuen & Co. Ltd. New York: John Wiley & Sons Inc. 15s. 593

A concise monograph on the properties and pharmacology of the vitamin, with numerous references at the end of each chapter.—R.M.

Anon. (1960). **Herb. I.M.I. handbook. Methods in use at the Commonwealth Mycological Institute.** pp. 103. Kew: Commonwealth Mycological Institute. 12s. 6d. 594

This handbook is dedicated to Mr. E. W. Mason to mark his retirement as Mycologist to the Commonwealth Mycological Institute. The 15 sections are by members of the staff and deal with different aspects of the history and work of the Institute and contain much information of use in all branches of Mycology. The main emphasis is on the establishment and maintenance of a collection of fungi of economic importance both in culture and in the herbarium and many special methods are described.

If veterinary mycology is to be provided

with a satisfactory taxonomic basis, the methods described here for the preservation of material for future reference will have to be adopted on an increasing scale.

This is an important book for it summarises 40 years of experience in Mycology. It should be available wherever fungi are studied.—P. K. C. AUSTWICK.

Wooldridge, W. R. (1960). **Farm animals in health and disease.** pp. xvi+533. London: Crosby Lockwood & Son, Ltd. 2nd Edit. 35s. 595

This book has been extensively revised since its first edition in 1954 and now contains 70 more pages. Examples of the revision may be taken from the chapters on pigs and poultry. Sections revised in the pig chapter include pneumonia and atrophic rhinitis and there are new sections on clostridial enterotoxaemia, zinc deficiency, agalactia and Teschen disease (but there is no mention of Talfan disease).

In the poultry section the sections on poultry hygiene, control of salmonella infections in chicks, coccidiosis (especially treatment) and avian leucosis have been re-written and there are new entries under yolk-sac infection in hatcheries, epidemic tremor, infectious synovitis, infectious bronchitis and other respiratory diseases, fowl typhoid and fowl cholera.

Where figures are available for the losses caused by a given disease, they have been brought up to date. The 56 plates of photographs are the same as before. At quite a low price this compendium is sure to find much use by veterinary students and as a refresher course for graduates.—R.M.

Hagemann, E. & Schmidt, G. (1960). **Ratte und Maus: Versuchstiere in der Forschung. [Rats and mice: laboratory animals in research.]** pp. x+318. Berlin: Walter Gruyter & Co. DM 48. 596

A handy book for research workers on the management, reproduction, genetics, anatomy, physiology, nutrition, use in research, and parasites and diseases of laboratory rats and mice. The two species are dealt with in separate sections under similar chapter headings. There are numerous classified references at the end of each of the two sections and there is an appendix on the mouse in the history, folklore and mythology of various nations. The 198 tables are valuable for quick reference. There are 75 illustrations

and a subject index. The high quality of the paper, print and general production of the book is reflected in its price.—E.G.

Vaccari, I., Ballarini, G., Pieresca, G., Bertoni, L. & Semellini, L. (1960). Attività svolta dal "Centro Ricerche Malattie della Selvaggina" (F.I.C.) durante il triennio 1956-1957-1958. Argomenti di patologia della selvaggina. [Report of the Research Centre for diseases of wild animals.] pp. 271. Faenza: Edizioni La Nuova Veterinaria. 597

The Research Centre forms part of the Faculty of Veterinary Medicine of the University of Parma. Its constitution and functions are described in the first part of this report and a list of scientific publications during the review period is given. Diagnostic activities are presented in tabular form showing the number and species of animals examined, clinical and laboratory investigations, and diseases diagnosed. The second part discusses the various aspects of wild fauna, the dangers of its destruction or reduction, and means of protecting it. The third and fourth parts deal with diseases of wild animals. Diseases discussed are: necrotic enteritis of partridges, myxomatosis, Newcastle disease, rabies and fowl pox; brucellosis in hares, avian infectious coryza, pasteurellosis, salmonellosis and TB.; aspergillosis, blastomycosis and dermatomycosis; histomoniasis, trichomoniasis, coccidiosis, plasmodium infection of birds, theileriosis in hares, balantidium enteritis and toxoplasmosis; diseases caused by arthropod and helminth parasites. The text is followed by 23 tables, giving various kinds of information on wild animals, and a glossary of some of the commoner scientific terms.—T.E.G.R.

Leonard, E. P. (1960). **Orthopedic surgery of the dog and cat.** pp. xii+296. Philadelphia (& London): W. B. Saunders Co. 87s. 6d. 598

The author, who is Professor of Small Animal Surgery at Cornell, has defined Orthopaedic Surgery as "that branch of surgery which deals with the corrective treatment of disease, or deformity, of the locomotor system." This book is confined almost entirely to surgery, and principally to that surgery which deals with fractures and luxations. The author describes the work as an introduction to small animal orthopaedics and says that in its compilation he has had the student particularly in mind. Those who require further information in a particular

field will find a representative list of references, some to British work, at the end of each chapter.

There are four sections dealing respectively with General Considerations, Fractures, Luxations, and Other Orthopaedic Diseases. In the first three the principal discussion centres around surgery of the osteochondropathies which involve locomotion. In the fourth Hip Dysplasia and Hypertrophic Pulmonary Osteoarthropathy are included—together with a consideration of Intervertebral Disc disease—primarily because of their relationship to locomotion, rather than because of their surgical aspects; the author has chosen arbitrarily, and apparently quite wisely, to exclude non-surgical conditions such as sprains, muscular disease, bone tumours and bone deformities.

The book begins with a consideration of the basic concepts of bone healing and the principles of aseptic surgical repair of fractures. In the same section there follows a description of the materials and methods employed in both open and closed techniques of fracture treatment.

The second section deals with fractures on a regional basis and is prefaced by a general chapter which covers incidence, classification, diagnosis and general principles of fracture treatment. This is a most complete and beautifully illustrated section. The photographic reproductions of the radiographs, as well as the pictures of the surgical operations, are first-class.

In a similar way the third section provides a workmanlike and concise exposition—again on a regional basis—of the luxations of the pelvic and pectoral limbs, mandible and spine. The author again opens up the section with a useful chapter on classification, diagnosis and general principles of treatment of luxations.

The last three chapters give a concise, comprehensive and practical coverage of Intervertebral Disc disease, Hip Dysplasia, and Marie's disease, respectively. The illustrations are again a prominent feature.

The author has drawn on a wide personal experience of canine orthopaedics and has coupled this with a very fair representation of the views of other workers. He has written with admirable clarity and from a very practical standpoint. It is certain this this work will become a standard textbook and that it will be welcomed by teachers and students of veterinary surgery, as well as by practising

veterinary surgeons. The publishers have played their part by producing an attractive volume of handy size. The reviewer's only regret is that the book is rather expensive.

—G. H. ARTHUR.

Bradley, O. C. (Revised by Grahame, T.) (1960). *The structure of the fowl.* pp. xii + 143. Edinburgh (& London): Oliver & Boyd. 4th Edit. 25s. 599

The new edition of this well known book has increased in size and price. It is fair to say that the former justifies the latter as fourteen pages of text, a considerable amount of additional information and a number of new illustrations have been added.

A completely new chapter on the blood has been introduced and a colour plate of the circulating blood cells forms the frontispiece. The chapter on circulation has been expanded by more detailed information on the kidney and illustrated with a good photograph of a vinylite cast. There are new illustrations in the chapter on the ear and a section is devoted to the structure and formation of bone. A further new feature is a well illustrated description of the autonomic nervous system but a good diagram of the main nerve trunks is still missing. The high incidence of neural lymphomatosis makes such a diagram desirable.

The group of veterinarians who take a special interest in the fowl is larger than it has ever been and is still expanding. All will find much to interest them in this book.

—B. S. HANSON.

Malies, H. M. (1959). *Applied microscopy and photomicrography.* pp. 143. London: Foul-  
tain Press. 22s. 6d. 600

A well produced profusely illustrated handy little book for technicians, research workers and other users of microscopes, containing chapters on the elements of optics, the compound microscope, the microscope stand, manipulation of the microscope, light sources and illumination, the binocular microscope, photomicrography, photographic processes and the phase-contrast technique.—E.G.

Smythe, R. H. (1960). *The female of the species.* pp. 142. London: Country Life Ltd. 21s. 601

The main theme is that the female plays, in a great many species, a more prolonged and intimate role in the production, care and education of the offspring than does the male.

By way of illustration much interesting detail is provided regarding behaviour, associated with reproduction and family life, in many insects, arachnids, fishes, reptiles, birds and mammals. The author's long experience of the ways of animals, his easy style and sly humour all increase the value of the book. The main trouble is that very few references are given and the reader is often left quite in the dark regarding what amount of care was taken to ascertain the various aspects of the phenomena described before any deductions were drawn. For instance (on p.67) the author refers to the raising of the upper lip in stallions and bulls in the presence of a female in oestrus. A deduction, different from that given, might have been drawn on knowing that cows, also, may show this behaviour pattern and that in the presence of another female not in oestrus.—A. BROWNLEE.

Podhradský, J. [Edited by.] (1960). Speciální zootechnika. Chov drůbeže. [Special zootechny. Part V. Poultry breeding and hus-

bandry.] pp. 826. Prague: Státní Zemědělské Nakladatelství. [State Agricultural Publishers.] Kčs. 67. [In Czech.] 602

This textbook has been compiled for the use of students of agricultural colleges. It consists of 15 sections, and six of the 19 authors are veterinarians. The sections deal with the origin and zoological classification of domestic poultry, their anatomy and physiology, characteristics and economic value, hatching, hereditary aspects of breeding, poultry improvement, nutrition, husbandry of fowls, ducks, geese, turkeys and guinea-fowls, diseases of poultry, hygiene and technology of poultry products. The section on diseases occupies an eighth of the book and contains chapters on diseases due to viruses, bacteria, fungi, helminths, arthropods, protozoa, vitamin and other nutritional deficiencies, non-infectious diseases of organs and poisoning; the clinical picture and conventional treatment of the more important poultry diseases are briefly described. There are 358 illustrations and the book is well produced.—E.G.

#### BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

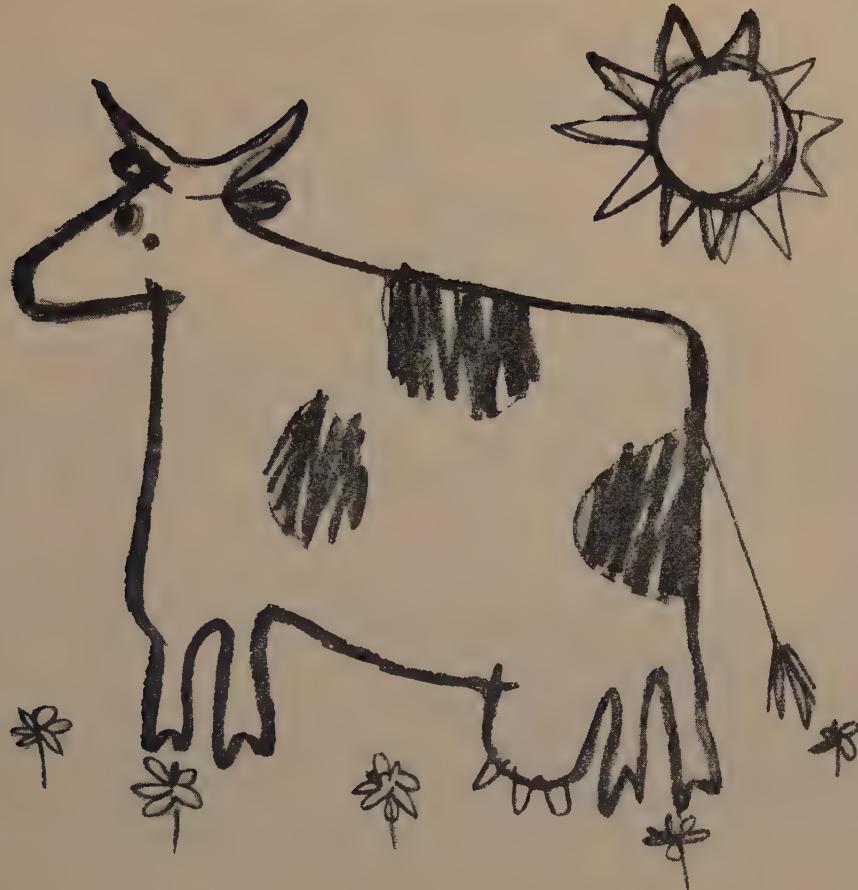
Brazier, M. A. B. (Edited by) (1960). The central nervous system and behavior. Transactions of the third conference, February 21, 22, 23 and 24, 1960. Princeton, N.J. pp. 475. New York: Josiah Macy, Jr. Foundation. \$7.50.

Lerche, M., Bartels, H. & Kelch, F. (Edited by) (1960). Schroeter, A./Hellich, M. Das Fleischbeschaugesetz nebst zusätzlichen Verordnungen und Gesetzen, mit Erläuterungen. Teil II. [Meat inspection law, with

explanations. Part II.] pp. viii + 366. Berlin (& Hamburg): Paul Parey. 7th edit. DM 26.

Osol, A. & Pratt, R. (Edited by) (1960). The dispensatory of the United States of America. 1960 edition. New drug developments volume. pp. vi + 240. Philadelphia (& Montreal): J. B. Lippincott Company. 72s.

—. (1960). British Postgraduate Medical Federation, University of London. Lectures on the scientific basis of medicine. Volume VIII, 1958-59. pp. ix + 461. University of London: The Athlone Press. 45s.



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## CONTENTS

	<i>Page</i>
Diseases caused by Bacteria and Fungi ... ... ... ... ...	107
Diseases caused by Protozoan Parasites ... ... ... ... ...	122
Diseases caused by Viruses and Rickettsia ... ... ... ... ...	126
Immunity ... ... ... ... ...	138
Parasites in Relation to Disease [Arthropods] ... ... ... ... ...	139
Parasites in Relation to Disease [Helminths] ... ... ... ... ...	140
Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis] ... ... ... ... ...	147
Nutritional and Metabolic Disorders ... ... ... ... ...	149
Diseases, General ... ... ... ... ...	154
Poisons and Poisoning ... ... ... ... ...	159
Pharmacology and General Therapeutics ... ... ... ... ...	160
Physiology, Anatomy and Biochemistry ... ... ... ... ...	162
Livestock Hygiene ... ... ... ... ...	165
Reproduction and Reproductive Disorders ... ... ... ... ...	165
Zootechny ... ... ... ... ...	168
Technique and Apparatus ... ... ... ... ...	169
Report ... ... ... ... ...	170
Book Reviews ... ... ... ... ...	170

Published 1960

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# INDEX TO AUTHORS

Allund, O., 929.  
 Adams, C. E., 958.  
 Adler, H. E., 683, 691.  
 Agrimi, P., 633.  
 Aikawa, J. K., 874, 875.  
 Akester, A. R., 939.  
 van den Akker, S., 715, 745, 887.  
 Akkermans, J. P. W. M., 889.  
 Allen, R. S., 855.  
 Anastos, G., 800.  
 Anderson, W. A., 963.  
 Anzai, H., 628.  
 Armbruster, O., 731.  
 Asahi, O., 956.  
 Ashida, K., 954, 955, 956.  
 Asso, J., 603, 723.  
 Aubrey, J. N., 962.  
 Avampato, J. E., 774.  
 Ayres, P. E., 969.

Bailey, R. W., 772.  
 Bain, R. V. S., 630.  
 Baisden, L. A., 830.  
 Bannister, G. L., 759.  
 Barnes, L. E., 693.  
 Baron, S., 791.  
 Barron, C. N., 845.  
 Bartley, E. E., 858.  
 Baum, G. J., 936.  
 Beck, W., 731.  
 Beerwerth, W., 614.  
 Behrens, H., 809.  
 Benedict, W. H., 900.  
 Benson, R. E., 968.  
 Benton, W. J., 687.  
 Beran, G. W., 771.  
 Berman, D. T., 607.  
 Bessmertnykh, A. A., 764.  
 Beveridge, W. I. B., 880.  
 Beyler, A. L., 910.  
 Bierer, B. W., 912, 913.  
 Binns, W., 963.  
 Biondi, E., 611.  
 Blaxter, K. L., 928.  
 Blincoe, C., 888.  
 Blobel, H., 607.  
 Bobin, A., 636.  
 Bömer, H., 891.  
 Boger, W. P., 604.  
 Bohlander, H. J., 653.  
 Bonadouce, A., 711.  
 Bood, P. H., 745.  
 Booth, A. D., 682.  
 Bosgra, O., 625.  
 Boulanger, P., 759.  
 Boyd, H., 657.  
 Boyd, J., 862.  
 Brakenridge, D. T., 649.  
 Brethour, J. R., 799.  
 Briggs, C. A. E., 975.  
 Brinkman, D. C., 984.  
 Brion, A., 773, 861, 898.  
 Brodrey, R. S., 842.  
 Brody, G., 831.  
 Brown, L. D., 857.  
 Brown, R. G., 692.  
 Bruns, P. D., 875.  
 Bryan, H. S., 957.  
 von Bülow, V., 836.  
 Bull, J. P., 924.  
 Burtscher, H., 746.  
 Butură, I., 631.  
 Buyske, D. A., 920.

Cabasso, V. J., 774.  
 Calvert, C. C., 865.  
 Camand, R., 724, 730.  
 Campbell, H., 641.  
 Campbell, R. C., 946.  
 Carlisle, H. N., 666.  
 Carlson, C. H., 639.  
 Carpenter, C. M., 648.  
 Castel, P., 820.  
 de Castro, S., 941.  
 Ceccarelli, A., 726.  
 Cernaia, I., 631.  
 Chabassol, C., 636.  
 Chambers, V. C., 776, 777.  
 Cheeseman, G. C., 975.  
 Chhay-Hancheng, 820.  
 Chieff, A., 947.  
 Christenberry, K. W., 900.  
 Clark, D. S., 634.

Clarke, E. M. W., 943.  
 Clarkson, M. J., 706.  
 Clayton, T. J., 858.  
 Clemente, J., 688.  
 Clifford, C. M., 800.  
 Cohen, D. W., 973.  
 Cole, C. R., 666, 710, 760.  
 Collier, W. A., 745.  
 Combs, B. O., 965.  
 Comfort, A., 851, 925.  
 Cordy, D. R., 633.  
 Cornell, R. G., 664.  
 Cornwell, R. L., 827, 828.  
 Cotchin, E., 837.  
 Coulston, F., 910.  
 Cover, M. S., 687.  
 Cowan, K. M., 755.  
 Cox, D. H., 863.  
 Crandell, R. A., 778.  
 Crecelius, H. G., 664.  
 Crofts, J. M., 948.

Dämmrich, K., 895.  
 Dahme, E., 902.  
 Dai N., 757.  
 Davey, L. A., 975.  
 Dekeyser, P., 670.  
 Delaunay, G., 621.  
 Dennington, E. M., 927.  
 DeTray, D. E., 769.  
 DeValois, D. G., 967.  
 Devos, A., 642.  
 Dewhurst, L. W., 818.  
 Dhenin, L., 723.  
 Diamond, L. S., 824.  
 Dodd, D. C., 649.  
 Donaldson, L. E., 962.  
 Dorsman, W., 805.  
 Dougherty, E., Jr., 748.  
 Douvres, F. W., 824.  
 Dowden, D. R., 854.  
 Doyle, J. T., 932.  
 Dozoa, L., 682.  
 Drághici, C., 631.  
 Droebeck, H. P., 910.  
 Drummond, R. O., 801.  
 Dubose, R. T., 789.  
 Dubost, P., 860.  
 Düwel, D., 807, 810.  
 Dukelow, W. R., 945.  
 Dutcher, R. M., 783.

Ebner, F. F., 778.  
 Eckert, J., 825.  
 Edson, E. F., 916.  
 Edward, D. G. F., 689.  
 Eisner, H. J., 920.  
 Eklund, C. M., 749.  
 Ekstedt, R. D., 608.  
 El Karib, E. A. A., 694.  
 Elliott, G. A., 650.  
 Elliott, R. T., 755.  
 Ellis, S. E., 866.  
 Engel, K., 794.  
 Enigk, K., 807, 810.  
 Entel, H. J., 646.  
 Epstein, S. S., 976.  
 Esteves, M. B., 720.  
 Estill, L., 934.  
 Evans, C. A., 776, 777.

Fagard, P., 674.  
 Fallon, G. R., 948, 949.  
 Farrell, R. K., 882.  
 Férida, M., 728, 729.  
 Fegley, H. C., 970, 972.  
 Fellner, F., 905.  
 Ferrando, R., 850.  
 Filissel, O. H., 878, 879.  
 Findlay, J. D., 926.  
 Fisher, R. B., 876.  
 Fisher, S., 606.  
 Fite, G. L., 792.  
 Fitzgerald, P. R., 833.  
 Flowers, A. I., 789.  
 Folley, S. J., 877.  
 Fomina, A. Y., 619.  
 Fontaine, J., 724, 730.  
 Fontaine, M., 773, 843, 898.  
 Fontaine, M. P., 898.  
 Fouquet, G., 621.  
 Francis, D. W., 641.  
 Frankel, J. W., 604.  
 Frederick, E. C., 945.

Fritsch, R., page 170.  
 Froyd, G., 813.  
 Fuchs, F., 767.  
 Fuentes, M. R., 750.  
 Fulthorpe, A. J., 654.  
 Furth, J., 900.

Ganter, P., 860.  
 Garbe, H. G., 731.  
 Gaver, O. H., 932.  
 Gavin, J. J., 604.  
 Gentry, G. A., 754.  
 Gentry, R. F., 684, 685.  
 Gerriets, E., 704.  
 Gianforte, E. M., 692.  
 Gibson, C. L., 709.  
 Ginanni, C., 817.  
 Girard, M., 773.  
 Gisler, D. B., 968.  
 Godfrey, J. F., 634.  
 Goedbloed, E., 715.  
 Goettler, V., 624.  
 Goetz, R. H., 932.  
 Golberg, L., 917.  
 Goldman, H. M., 973.  
 Gordon, R. S., 864.  
 Goret, P., 603, 773.  
 Gorham, H. J., 882.  
 Gorzynski, E. A., 628.  
 Gossett, F. O., 693.  
 Gottschalk, C., 846.  
 Gourlay, R. N., 911.  
 Gowland, G., 662.  
 Graber, M., 820.  
 Graham, E. F., 945.  
 Graham, G. L., 971.  
 Grant, C. A., 841.  
 Gras, G., 820.  
 Gratzl, E., 782.  
 Greenbaum, A. L., 877.  
 Grewal, M. S., 696.  
 Griesemer, R. A., 760.  
 Griffiths, H. J., 882.  
 Griffiths, T. W., 871.  
 Grumbles, L. C., 761, 789.  
 Guarda, F., 914.  
 Guillon, J., 669.  
 Guillot, G., 636.

Habermann, R. T., 792.  
 Haga, T., 655.  
 Hale, O. M., 863.  
 Hall, W. T. K., 707.  
 Hancock, J. L., 946.  
 Harker, K. W., 911.  
 Harvey, T. L., 799.  
 Hatzios, B. C., 753.  
 Hayashi, M., 955.  
 Hayman, B. I., 964.  
 Heap, R. B., 953.  
 Heilman, D. H., 648.  
 Helmboldt, C. F., 747.  
 Helmreich, R. L., 959.  
 Hemmes, J. H., 793.  
 Henderson, A. E., 964.  
 Henderson, W. M., 719, 721.  
 Henson, J. B., 761.  
 Hentges, J. F., 950.  
 Hinshaw, L. B., 639.  
 Hirata, A. A., 796.  
 Hirato, K., 775.  
 Hitchner, S. B., 788.  
 Hörtner, R., 661.  
 Hong-Fang Lee, 835.  
 Hook, A. E., 969.  
 Hoornens, J., 922.  
 van der Horst, C. J. G., 868.  
 Horton-Smith, C., 702.  
 Howard, D. H., 648.  
 Howes, J. R., 950.  
 Huggins, C., 935.  
 Hughes, C. A., 802.  
 Huq, M. M., 716.  
 Hwang, J., 747.  
 Hymas, T. A., 907.

Ibrischimoff, N., 853.  
 Ihlenburg, H., 743.  
 Inukal, Y., 655.  
 Isaacs, A., 791.  
 Itikawa, O., 751.  
 Ivanov, A. D., 735.  
 Ivens, M. S., 673.

Iwan, L. G. R., 802.  
 Iyer, C. G. S., 780.

Jacobson, D. R., 854.  
 Jacobson, N. L., 855.  
 Jansen, J., 785, 786, 884.  
 Jarrett, I. G., 878, 879.  
 Jarrett, W. F. H., 822.  
 Jean-Blain, M., 870.  
 Jenkinson, D. McE., 926.  
 Jensen, D., 901.  
 Jobse, A. S., 620.  
 Johnson, D., Jr., 909.  
 Johnson, R. H., 855.  
 Jolivet, G., 669.  
 Jordan, F. T. W., 923.  
 Joubert, L., 603, 870.  
 Joyner, L. P., 708.  
 Julou, L., 860.  
 Juniper, J. R., 709.  
 Justice, W. H., 659.

Kanarek, A. D., 639.  
 Kaplan, W., 673.  
 Karg, H., 960.  
 Karsai, F., 904, 905.  
 Kast, A., 893.  
 Keen, E. N., 932.  
 Kelly, A. L., 901.  
 Kelly, R. G., 920.  
 Kelton, W. H., 685.  
 Kenny, G. E., 680.  
 Kerr, W. R., 644.  
 Kersjes, A. W., 921.  
 Kersten, W., 893.  
 Khanbegyan, R. A., 811.  
 Khun Shan-Ven, 651.  
 Kimball, A. W., 900.  
 King, J. O. L., 852.  
 Kiser, J. S., 688.  
 Kiser, K. H., 774.  
 Klima, J., 782.  
 Kodlek, E., 878.  
 Koestner, A., 710.  
 Kohler, P. H., 798.  
 Kolb, E., 629.  
 Kolochine-Erber, B., 650.  
 Kontrinavichus, L. M., 619.  
 Kool, S. M., 793.  
 Konstantinoff, A., 853.  
 Kowalewski, H. V., 969.  
 Kramer, T., 638.  
 Krassner, S. M., 705.  
 Kratzer, F. H., 867.  
 Kremer, A. E., 899.  
 Kristanoff, T., 853.  
 Kronberger, H., 838.  
 Kronthaler, O., 960.  
 Kuil, H., 886.  
 Kujungiev, I., 623.  
 Kunishige, T., 775.  
 Kunst, H., 785.  
 Kuziela, T., 647.

Labie, C., 843, 898.  
 Lagerlöf, B., 848, 849, 850.  
 Lamming, G. E., 953.  
 Lamond, D. R., 952.  
 Lang, R., 724, 730, 765.  
 Langer, B., 797.  
 Larsen, A. B., 622.  
 Lassiter, C. A., 857.  
 Lauwers, R., 670.  
 Leach, T. M., 694.  
 Lecke, J. G., 659, 660.  
 Leftheriotis, E., 724, 765.  
 Lehnert, C., 609.  
 Lennon, H. D., Jr., 937.  
 Lesser, E., 698.  
 Liem, N. V., 757.  
 Liener, E., 808.  
 Lilly, H. A., 924.  
 Litsky, W., 783.  
 Lord, T. H., 838.  
 Lowbury, E. J. L., 924.  
 Lucan, F., 729.  
 Lucas, A. M., 927.  
 Lueker, J. T., 826.  
 Ludwig, E. H., 685.  
 Lübeck, A., 733.  
 Luginbuhl, R. E., 747.  
 Lundvall, R. L., 672.  
 Lysikowska, L., 647.  
 Lyubashenko, S. Y., 651.

McConnell, K. P., 899.  
 McDiarmid, A., 643.  
 MacFadden, D. L., 858.  
 McGregor, M., 932.  
 Machlin, L. J., 864.  
 McIntyre, W. I. M., 822.  
 McKay, K. A., 686.  
 Mackowiak, C., 730, 765.  
 McManus, D., 819.  
 McMillan, B., 697.  
 MacMillan, R. L., 969.  
 Madden, D. H. L., 951.  
 Maddy, K. T., 664, 665.  
 Mahoney, D. F., 655.  
 Mailloux, M., 650.  
 Málková, D., 742.  
 Manktelow, B. W., 668.  
 Marble, D. W., 888.  
 Marples, M. J., 671.  
 Marquardt, W. C., 699.  
 Marraro, G., 744.  
 Marshall, I. D., 781.  
 Marshall, V., 772.  
 Martin, L. E., 917.  
 Martinsons, E., 896.  
 Mathois, H., 615.  
 Matscher, K., 877.  
 Maurice, G. E., 666.  
 Mayr, A., 725.  
 Mazzini, C. A., 722.  
 Mehring, A. L., Jr., 909.  
 Mellors, R. C., 847.  
 Mémery, G., 678, 679.  
 Mesler, R. J., Jr., 907.  
 Meyer, R. E., 936.  
 Michel, C., 636.  
 Michel, J. F., 827.  
 Millen, T. W., 784.  
 Mills, C. F., 869.  
 Minh, N. N., 757.  
 Mitscherlich, E., 919.  
 Mixner, J. P., 937.  
 Molchanov, S. G., 651.  
 Moore, B., 801.  
 Moore, R. W., 790.  
 Morris, A. L., 842.  
 Monroe, J. S., 847.  
 Nagra, C. L., 930.  
 Narashimha Murthy, D. P., 780.  
 Nardelli, L., 727.  
 Nossal, J., 613.  
 Natschaff, B., 853.  
 Nelson, J. B., 681.  
 Nemeséri, L., 701.  
 Nesheim, M. C., 865.  
 Neter, E., 628.  
 Newberne, J. W., 934.  
 Newton, G. R., 641.  
 Nguyen-ba-Luong, 757.  
 Nguyen-Van-Ai, 978.  
 Nickel, E.-A., 832.  
 Nielsen, K., 929.  
 Nishida, T., 988.  
 Noakes, D. N., 916.  
 Norton, H. W., 856.  
 Novikova, L. S., 651.  
 Numans, S. R., 921.  
 Okamoto, R., 935.  
 Okazaki, K., 676.  
 Olesiuk, O. M., 690.  
 Olson, N. O., 632.  
 Orstadius, K., 908.  
 Orue, J., 678, 679.  
 Ose, E. E., 693.  
 Oser, B. L., 839, 840.  
 Oser, M., 839, 840.  
 Ott, A., 638.  
 Otte, E., 758.  
 Oudar, J., 870.  
 Owen, E. C., 866.  
 Panina, G., 727.  
 Paraf, A., 603, 723.  
 Parnas, J., 647.  
 Pascal, S., 860.  
 Patterson, J. L., 932.  
 Pearson, J. C., 815.  
 Peck, E. F., 758.  
 Perini, G., 635.  
 Petermann, H. G., 724, 730.  
 Phu, L. H., 757.  
 Pichugin, L. M., 651.  
 Pigoury, L., 636.  
 Pilet, C., 773.  
 Pilz, W., 781.  
 Pistor, W. J., 818.  
 Planas, J., 941.  
 Pollard, M., 790.  
 Pollock, M. E., 680.  
 Popken, F., 688.  
 Popper, H., 839, 840.  
 Portolés, A., 918.  
 Poussot, A., 636.  
 Pressman, D., 794.  
 Price, J. I., 748.  
 Prokhorov, A. V., 619.  
 Quinchon, C., 605.  
 Radeleff, R. D., 804.  
 Radkevich, P. E., 708.  
 Rajagopal, P. K., 780.  
 Randall, C. C., 754.  
 Read, R. B., Jr., 783.  
 Reagan, R. L., 753.  
 Reber, E. F., 856.  
 Redaelli, G., 635.  
 Reed, H. C. B., 657.  
 Reed, R. E., 665, 818.  
 Regnery, D. C., 781.  
 Reis, J. M., 947.  
 Renaud, L., 787.  
 Renieri, G., 744.  
 Rhodes, W. H., 912, 913.  
 Rice, E., 648.  
 Richou, R., 605.  
 Richou, R. (Mme), 605.  
 Riehl, L. A., 803.  
 Roberts, R. H., 804.  
 Robertson, J., 866.  
 Robijns, K. G., 620.  
 Robinson, V. B., 934.  
 Rodriguez, J. L., Jr., 803.  
 Röhner, H., 766.  
 Van Roekel, H., 690.  
 Rogoff, W. M., 798.  
 Romagnoli, A., 711.  
 Romberg, P. F., 672.  
 Rose, J. H., 829.  
 Ross, E., 915.  
 Ruckebusch, Y., 870.  
 Salei, P. I., 652.  
 Sanford, J., 923.  
 Santoro, G., 727.  
 Saslaw, S., 666.  
 Sauer, R. M., 970, 972.  
 Saunders, L. Z., 845.  
 Sauer, E., 750.  
 van der Schaaf, A., 890.  
 Schaaf, J., 614.  
 Schaeffler, W. F., 834.  
 Schatz, D. L., 797.  
 Schechter, A. M., 796.  
 Schenker, H., 838.  
 Schilbach, R., 637.  
 Scholz, H.-D., 626.  
 Schulze, P., 732.  
 Schulze, W., 822.  
 Schwarz, J., 667.  
 Schweckendiek, O. E., 731.  
 Scott, G. R., 755.  
 Scott, M. L., 865.  
 Seiffner, W., 656, 762.  
 Seibold, H. R., 734.  
 Seidel, H., 629.  
 Seidlitz, P., 712.  
 Semenov, L. P., 922.  
 Seymour, W. R., 682.  
 Shalkop, W. T., 811.  
 Sharp, N. C. C., 822.  
 Shaw, I. G., 946.  
 Shelley, H. J., 940.  
 Shepard, C. C., 663.  
 Sherman, M., 915.  
 Shibata, T., 751.  
 Shimizu, Y., 775.  
 Shitov, K. A., 652.  
 Siegmann, O., 836.  
 Sinha, P. K., 814.  
 Skamser, L. M., 692.  
 Smith, G. R., 632.  
 Smith, J. M. B., 671.  
 Smith, J. P., 917.  
 Snell, V. N., 665.  
 Solov'ev, S. I., 652.  
 Sonoda, M., 931.  
 Srivastava, H. D., 814.  
 Stanworth, D. R., 974.  
 Starr, T. J., 790.  
 Stebbins, M. R., 774.  
 Steiner, J. W., 797.  
 Stephen, L. E., 695.  
 Sternberg, S. S., 839, 840.  
 Stöckl, W., 615.  
 Straußl, P., 844.  
 Straub, M., 667.  
 Strehl, W., 812.  
 Stuart, A. E., 977.  
 Sugimura, K., 955.  
 Sullivan, D. J., 963.  
 Sutherland, G. B., 795.  
 Suwa, T., 676, 677.  
 Svanbaev, S. K., 700.  
 Syverton, J. T., 680.  
 Szent-Iványi, T., 610.  
 Tanami, Y., 790.  
 Taylor, J., 640.  
 Tejerina, G., 918.  
 Terpstra, J. I., 839.  
 Tesink, J., 620.  
 Thiel, W., 616.  
 Thienpont, D., 674.  
 Thiéry, G., 678.  
 Thomas, J. B., 912.  
 Thomas, L. A., 749.  
 Thomson, R. O., 654.  
 Thoone, J., 892.  
 Titus, H. W., 909.  
 Tozzini, F., 763.  
 Trapido, H., 780.  
 Trautman, R. J., 665, 818.  
 Trautwein, G., 770, 894.  
 Tromba, F. G., 830.  
 Truscott, R. B., 686.  
 Yagi, Y., 794.  
 Yasarov, S., 816.  
 Yashchinski, B., 756.  
 Yasin, S.-A., 716.  
 Yoshida, T., 676, 677.  
 Yotis, W. W., 608.  
 You-Ling Fan, 639.  
 Young, R. J., 968.  
 Zahran, G. E. D., 717.  
 Turk, J. L., Jr., 867.  
 Turner, J. H., 821, 823.  
 Tverskoy, G. B., 930.  
 Übertini, B., 727.  
 van Ulsen, F. W., 658.  
 Underdahl, N. R., 771.  
 Upton, A. C., 900.  
 Uray, H., 961.  
 Vanbreuseghem, R., 670.  
 Vandeplassche, M., 642.  
 Vandervelden, M., 674.  
 Vandesteene, R., 674.  
 Vardaman, T. H., 622.  
 Vegors, H. H., 826.  
 Verge, J., 603, 723.  
 Vicard, A., 617.  
 Vick, J. A., 639.  
 Vickers, C. L., 912.  
 Voss, R. C., 886.  
 Vu Thien Thai, 757.  
 van der Waaij, D., 714.  
 Wagenaar, G., 885.  
 Wainman, F. W., 928.  
 Warner, D. R., 855.  
 Warnick, A. C., 950.  
 Warren, J. V., 932.  
 Watanabe, M., 676, 677.  
 Van Waveren, C. M., 644.  
 Weimer, H. E., 648.  
 Weins, D., 645.  
 Weiser, H. H., 862.  
 Weiser, R. S., 777.  
 Weiss, E., 903.  
 Weiss, J. B., 976.  
 Welshimer, H. J., 627.  
 Wemmenhove, R., 786, 884.  
 Wenner, H. A., 771.  
 Wensvoort, P., 887.  
 Werder, A. A., 771.  
 Werner, H., 712, 713.  
 Westhues, M., p. 170.  
 Wheeler, H. G., 804.  
 Whelan, M. A., 687.  
 Wiersema, J. P., 886.  
 Wikerhauser, T., 806.  
 Williams, F. P., Jr., 792.  
 Williamson, J., 695.  
 Wilson, A. L., 866.  
 Wilson, J. G., 821, 823.  
 Wilson, J. E., 618.  
 Wilson, J. H. G., 625.  
 Winkler, K. C., 793.  
 Winter, A. R., 862.  
 Winterfeld, R. W., 788.  
 Wittmann, G., 725.  
 Wolff, J. W., 653.  
 Wolin, M. J., 933.  
 Woods, W. R., 855.  
 Work, T. H., 780.  
 Wrich, M. J., 801.  
 Wright, A., 923.  
 Wuest, E. C., 831.

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in collaboration with the

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